ESTABLISHED IN 1872

PAPER TRADE JOURNAL

With Which Is Combined

PAPER

Vol. XCII, No. 14 Thursday, April 2, 1931

Important News Print Merger May Be Near

Opinion Generally Expressed That Proposed Giant Consolidation of Prominent News Print Corporations Was Freely Discussed At Meeting Held In Montreal of Leading Executives of Industry—Public Utility Properties Would Not Be Included In Merger—Rumors of Unsettlement In News Print Quotations Again Current

[FROM OUR REGULAR CORRESPONDENT]

MONTREAL, Que., March 30, 1931.—Much interest has again been centered on the news print industry here by the presence in Montreal of a group of leading executives in the industry, coinciding with a report from New York suggesting that the long-talked-of merger of three of the largest units in the industry is imminent. As regards the gathering here, nothing of an official nature was forthcoming beyound the confirmation that a meeting of the Newsprint Institute of Canada was in session. This organization has been in more or less of a moribund state since the resignation sometime ago of the president, Col. J. H. Price, president of Price Bros. & Co. Rumors of unsettlement in the price of news print were again current, but the meeting was not productive of any announcement of developments.

Strong opinion prevailed, however, that attention was given by the executives meeting here to the giant merger of news print corporations which has been talked of for so long. According to New York despatches published here negotiations to this end have reached an advance stage, but after the meeting here strong opinion prevailed that any merger was still a considerably way off. No additional information beyond that which has already appeared in the PAPER TRADE JOURNAL was contained in the despatches from New York. It was stated that, as already indicated, the merger initially may be between Abitibi Power and Paper, Minnesota and Ontario Paper Company, and Canadian International Paper Company, other companies reported to be engaged in the conversations being Canadian Power and Paper Corporation, the St. Lawrence Corporation, and Price Bros. & Co.

Some Properties Not Included

The information is repeated that the public utility properties of such companies as Canadian International Paper, including such power plants as are not devoted wholly to the operation of pulp and paper manufacture, will not be included in any merger. The Minnesota and Ontario Company is now in the hands of the receiver, although that receiver is its president, E. W. Backus, of Minneapolis. As regards Canada Power and Paper, that company is also in financial difficulties, and an early re-organization of the capital structure of the corporation has been announced by J. H. Gundy, president. A protective committee of security holders has already been formed. This reorganization would be a preliminary step to the possible inclusion of the company in the proposed merger. Sixty per cent of the company's equipment is now lying idle, the mills closed being the St. Maurice Valley and Port Alfred, while the Belgo plant is running about 80 per cent of capacity.

The Abitibi Company is having difficulty in keeping plants going, and this week announced the closing of another mill, that of the Ste. Anne Paper Mills at Ste. Anne de Beaupre, Que., which has a daily capacity of 275 tons of news print.

International's N. B. Power Development

From St. John, N. B., it is announced that N. C. Head, executive officer of the International Paper Company, has indicated an enlargement of the development at Grand Falls, N. B., because of the expectation of improved business. The Grand Falls development, today, supplies the electrical energy for the plant of the New Brunswick International Paper Company at Dalhousie, N. B.

These facts were gleaned when the purpose of a bill before the Provincial Legislature was asked for the taking over by the Gatineau Power Company of the Saint John River Power Company, both of which are subsidiaries of the International Paper and Power Company. In his statement, Mr. Head says that "their consolidation is designed to facilitate further expansion of our properties in New Brunswick. We expect that in the very near future our progress will make it important to take the next step of supplementing the four units of Grand Falls, either by additional storage or by a steam plant or both. It is desirable to have one company handle the entire power supply, both steam and hydro. Still further extension, through steam plant establishment, may prove more economical than additional storage reservoirs. I authorize you to make a statement to this effect."

B. C.'s News Print Output

Figures furnished by the Powell River Company and Pacific Mills, Ltd., indicate that news print production in British Columbia last year was valued at nearly $12,000,000.

News print to the amount of 277,000 tons was manufactured by these two companies during the past year, representing a considerable increase in tonnage as compared with 1929. Pacific Mills production was down to some extent owing to the freeze-up and power shortage early in the spring.

It is probable that news print output during the present year will be the highest on record as a result of the completion of the new Lois River development of the Powell River Company which will enable that company to average about 620 tons daily as compared with 500 tons the previous year. The No. 7 machine of Powell River Company has been in operation since the beginning of the year.

Pennsylvania Paper Mills Speed Production

Increased Orders Received Result In Operations Being Expanded From Five-Day to Full Time Schedule, In Some Instances—Philadelphia Paper Merchants Experience More Lively Demand For Many Seasonally Active Grades of Paper.

[FROM OUR REGULAR CORRESPONDENT]

PHILADELPHIA, Pa., March 30, 1931.—Paper merchants have been enjoying a livelier demand for many lines of seasonally active products. There is more confidence expressed in the near future. Inquiries for large shipments of paper goods are expanding. Manufacturers find orders growing and are accordingly speeding up protection from the five day week to full time schedule. All report livelier demand. Prices are steady, though manufacturers state they are working on a thin margin of profits in many lines that have been subjected to adjustment. Glassines and boards have been affected by keen competition.

Fine paper consumption gains as the many grades of writings, bonds and book papers, grow in demand. Prices are steady. Coated book papers, which have been lagging, are now moving in slightly better volume. Contract orders for bulky book papers have, on the contrary, shown a slowing up, though steady in values. Parchments are fairly well maintained and steady. Travellers who have been covering the territory below the Mason and Dixon Line state that buying of fine papers in the South is better than in the Eastern territory covered by the Philadelphia mill representatives. Twines, distributed through paper dealers, are slightly better, though still holding to rock bottom prices. Wrapping papers and specialties continue to expand. Bags and corrugated products have been steadily advancing.

When the members of the wrapping paper group allied with the Philadelphia Paper Trade Association met at the Down Town Club last week to report on statistics for the four week period beginning February 23 and ending March 21 it was shown that the combined orders showed an increase of eighty orders over the previous four week period taken up by the members for compilation of business records, with a view to acquiring actual trading conditions and tonnage with costs of conducting business. However, despite this increase in eighty orders, there was a decline of nearly 100,000 pounds in volume and $4,000 in sales valuation. Average Selling Price for rolls on mill shipments advanced 17 cents per cwt., and on sheets declined 18 cents per 100 lbs., which is explained by an increase in the average quantity of the sheet orders and a decline in the weight of the average roll order. From warehouse stocks the average price for rolls advanced 7 cents per 100 lbs., but since 75 per cent of the orders were for less than 250 lbs., this advance hardly compensated the houses for the additional handling charges involved. The price on sheets from warehouse declined 11 cents per pound but the orders increased somewhat in size.

Paper and Twine Merchants Hear Kraft Discussed

With the mill representatives and paper distributors, both concerned over the kraft situation and application of measures that will adjust that phase of the trade into line with profitable business conduct, the members of the Paper and Twine Merchants Association of Philadelphia met at the Adelphia Hotel and heard T. H. B. Smythe, of the J. L. N. Smythe Company, give an interesting discourse on kraft and a plan in detail for the stabilizing of that commodity. The gist of Mr. Smythe's plan for stabilizing the kraft market was a proposal to have the manufacturers set a minimum resale price as means for elimination of price cutting and to leave a fair margin of profit for the dealer. Then followed the forum, with questions and answers, and experiences given by the members.

Following the application for a charter under the laws of Pennsylvania, the Paper and Twine Merchants Association last week announced the granting of its incorporation. The body is the only organization of its kind in this country and its members are composed of mill representatives, large paper dealers featuring quantity sales of both paper and twine, and twine distributors and manufacturers. Almost 100 per cent representation of trade houses in this group in the territory are linked in the enrollment. The organization will hold a spring outing and sporting tour to include a golf tournament, quoit and tennis contests, and play for the annual golf cup award donated by the Schuylkill Paper Company.

R. T. Moorhouse Mill Being Dismantled

Following the sale of the mill property of the R. T. Moorhouse Paper Company, the first paper mill in America to manufacture book papers from reclaimed paper stock and to produce a low priced book grade, dismantling began last week. The mill will dispose of its machines, including three Fourdriniers, heaters, washers, steam and power units, engines, boilers and machine shop equipment. The mills, dating back to 1881, have been modernized in recent years. A year ago the mill property was sold to the Charles Lennig Company, chemical manufacturers, and will be occupied by that firm when the machines and equipment have been disposed of. The present proprietor is R. T. Moorhouse, son of the founder of the business, Robert Owen Moorhouse, pioneer low priced book paper manufacturer in this country.

Walter R. Kurtz to Join Schuylkill Paper Co.

Walter R. Kurtz, formerly assistant manager of the W. C. Hamilton & Sons, paper manufacturers, Miquon, Pa., near Philadelphia, will this week take up his duties with the Schuylkill Paper Company, 437 Chestnut street, having severed his association with the paper mills last week. He will become associated with the sales division of the Schuylkill company in the Philadelphia and New York territory. He will specialize in book papers. He was connected with the Hamilton company for the past nine years.

Wharton School to Stage Direct Mail Meeting

As an important feature in modern business methods and the generally accepted progressiveness associated with this factor of trade practice, the Wharton School of Business Administration of the University of Pennsylvania, is to hold a special meeting at the Irvine Auditorium devoted to Direct Mail Advertising, on April 22. The meeting, which will be held in the evening, will be under the auspices of the Wharton School, the Educational Committee of the Direct Mail Advertising Association, Direct Mail Committee of the Poor Richard Club, Temple University and Drexel Institute.

President George W. Ward, of the D. L. Ward Paper Company, is chairman and will preside. Dean Emory Johnson, of the Wharton School, will call the meeting and give a talk on Direct Mail matters, while Dr. Herbert W. Hess, head of the Department of Merchandising of the Wharton School, will also be among the speakers from the University. There will be exhibited in the auditorium lobby during intermission the Direct Mail Leaders Exhibit of the fifty best direct mail campaigns conducted in the past year and assembled by the association under direction of George W. Ward, who was the originator of these exhibits and held them annually for more than ten years at the Ward company headquarters in this city and last year turned them over to the Direct Mail Advertising Association.

Charles McDowell Back From Florida Cruise

Charles McDowell, head of the McDowell Paper Mills, Manayunk, returned last week from a three weeks' cruise on the yacht of Colonel Charles Eisenlohr, off the coast of Florida and in other

southern waters, where good fishing abounds. While in the south he met Allen Fletcher, of the Fletcher Paper Company, Alpena, Mich., who was also enjoying a brief holiday. The McDowell mills have been accumulating orders and are running full time on glassine papers.

Du Pont's Feature Cellophane Exhibit

There has been arranged for the summer months a permanent exhibit of the uses to which cellophane may be put for the inspection of the throngs who promenade the board walk in Atlantic City. The exhibit is part of the DuPont displays made at its Pier on the board walk. It includes almost all the large cigar manufacturers of the country. A similar display is also made at the DuPont-Biltmore Hotel, Wilmington, Del. Prices of cellophane were reduced in the past month.

Radnor Mills to Suspend

The Radnor mills, of the Jessup & Moore Paper Company, Elkton, according to notices given its employees will close the last of April. Two reasons are given for the closing of the mill by the company, the delay of the Government in dredging Elk River for navigation in bringing poplar wood to Elkton, and Western competition making inroads in the pulp manufacturing business in bringing their product East, cheaper than it could be manufactured here.

Receivers Appointed for Reid Newfoundland Co.

[FROM OUR REGULAR CORRESPONDENT]

MONTREAL, Que., March 23, 1931.—A new complication has arisen in connection with the proposal to establish a 1000-ton news print mill in Newfoundland, by the announcement that the Reid Newfoundland Company and subsidiaries have been placed in the hands of a receiver. It was only a week ago that the Newfoundland government announced the terms upon which negotiations were going on with the Reid company for the development of the big Gander River project. These terms were submitted by Allan S. Butler, a large debenture holder in the company, and now appointed its manager under the receivership. Interests in the company centre in Montreal, and it is stated here that the appointment of a receiver is not expected to have any material effect on the proposal before the government.

Until about 75 years ago the Reid company operated a railway in Newfoundland, but this was sold to the government which now operates it.

Export Fiberboard Association Formed

Formation on the Pacific Coast of the Export Fiberboard Case Association for the purpose of promoting the use and acceptance of fiberboard cases in export trade was announced here today by H. L. Stilwell, managing director.

Sponsors of the organization, which will be made nationwide in scope, include many leading fiberboard case manufacturers. Mr. Stilwell was chosen to manage the group following his experience of more than 20 years as a salesman, advertising executive and packing engineer.

The association will establish a standard of merit for all fiberboard cases used in the export trade, providing a trademark to be used by all members.

Pacific Coast offices have been established in San Francisco and other headquarters are to be opened soon in New York and abroad, according to Mr. Stilwell.

F. C. Huyck & Sons Elect Directors

[FROM OUR REGULAR CORRESPONDENT]

RENSSELAER, N. Y., March 16, 1931.—At the annual meeting of stockholders of F. C. Huyck & Sons the following directors for the year were chosen: Frank C. Huyck, Elizabeth H. Eldridge, Holden M. Ashby, James L. Brennan, Harold E. Parkman, David M. Myers, Watson A. Yule, Thomas I. Van Antwerp and Woolsey W. Weed. The inspectors of election were Frank Siddle and W. S. Wooster.

Paper Production for January

According to identical mill reports to the Statistical Department of the American Paper and Pulp Association from members and cooperating organizations, the daily average of total paper production in January increased 3 per cent over December but was 21 per cent under January, 1930. The daily average wood pulp production in January was 1 per cent under December, 1930 and 24 per cent under January, 1930.

Compared with January a year ago, the daily average production registered a decrease in the following grades: News print, uncoated book, paperboard, wrapping, bag, writing, hanging and building papers. The January, 1931 daily average production of paper board, bag, tissue and hanging papers was lower than in December, 1930. Total shipments of all major grades decreased 18 per cent during January, 1931 as compared with January, 1930.

Identical pulp mill reports for January, 1931 indicated that the total pulp consumed by reporting mills was 20 per cent less than for January, 1930, while total shipments to the open market during January were sharply below the total for January, 1930.

All grades of pulp, excepting bleached, easy bleaching, mitscherlich sulphite and kraft pulps, registered decreases in inventory at the end of January, 1931, as against the end of December, 1930. As compared with January, 1930, soda pulp was the only grade whose inventory registered a decrease.

REPORT OF PAPER OPERATIONS IN IDENTICAL MILLS FOR THE MONTH OF JANUARY, 1931

Grade	Production tons	Shipments tons	Stocks on hand end of month tons
News print	105,527	104,769	32,903
Book (uncoated)	71,827	72,500	62,258
Paper board	153,989	148,388	63,451
Wrapping	46,358	44,965	42,390
Bag	10,658	10,258	6,871
Writing, etc.	26,933	28,735	49,805
Tissue	14,730	14,947	13,552
Hanging	4,294	4,034	4,493
Building	3,595	4,222	2,880
Other grades	17,780	16,930	15,625
Total—All grades	455,691	449,748	294,228

REPORT OF WOOD PULP OPERATIONS IN IDENTICAL MILLS FOR THE MONTH OF JANUARY, 1931

Grade	Production tons	Used during month tons	Shipped during month tons	Stocks on hand end of month tons
Groundwood	70,254	68,343	2,287	47,770
Sulphite News Grade	31,030	29,863	1,459	6,476
Sulphite Bleached	22,251	20,230	2,144	4,624
Sulphite Easy Bleaching	2,969	2,578	365	1,394
Sulphite Mitscherlich	7,216	6,015	868	1,702
Kraft Pulp	26,066	22,191	3,867	7,945
Soda Pulp	18,864	15,072	4,269	2,769
Pulp—Other grades	54	.....	49	19
Total—All grades	178,704	164,292	15,308	72,699

March 17, 1931

Hurlbut Paper Co. Starts Second Machine

[FROM OUR REGULAR CORRESPONDENT]

SOUTH LEE, Mass., March 30, 1931—The Hurlbut Paper Company of this town started up its second machine the past week. The mill was opened last September and has been rapidly developing its lines since. The famous old grands of Extra Superfine, Bank Bond and Authors Linen are being revived and improved.

An interesting fact is that on the site of this mill in the old hand paper making days an operative would beat by mortar and pestle process five pounds of stock to yield his quota of 10 reams a day. Recently in clearing out an old attic in South Lee, documents were found dating back to 1819 written on paper made in this mill by hand.

The new machine is equipped with a new patent which is said to minimize the stretching and shrinking of fiber that is necessitated by the use of the Fourdrinier machine.

There has also been introduced a new process by which a line of four-sided deckle edge paper is manufactured of about any size from a postal card up.

Ontario Fine Paper Mills Increase Output

Paper Merchants Experience Satisfactory Demand and Tonnage Movement Is Expanding—Book Paper In Excellent Request At Present—Writing, Ledger, and Bond Papers Going Forward In Good Volume—Coarse Paper Section Improves Slightly

[FROM OUR REGULAR CORRESPONDENT]

TORONTO, March 30, 1931—March has closed with a fairly satisfactory volume of business in wholesale paper circles in Ontario, although it must be said that there is very little doing in the way of big order business. Despite this fact, however, fine papers, particularly, are enjoying quite a fair sale and turnover and tonnage is gradually being increased both by the mills and the paper merchants. There is quite a fair call for writings, ledgers and bonds and a really good demand for book paper. The mills report some orders ahead in all branches of the fine paper trade—a condition that contrasts with a few weeks ago, when some difficulty was being experienced in getting sufficient orders to keep machines running.

On the other hand, only slight improvement has been shown in the coarse paper section. Rather quiet retail conditions among the general retail trade have affected sales of paper bags and wrappings and mills manufacturing these lines are operating lightly. A few coarse paper wholesalers report March as having been as good a month as February—and better in some cases—but the coarse paper market is not nearly as firm, nor is it yielding as much business as the fine paper division. For one thing it is suffering from foreign importations, as well as from a restricted demand from business and commercial circles generally.

The converting section of the paper trade is still quiet, according to the testimony of envelope manufacturers and firms making general stationery lines. Light weight paper manufacturers are fairly busy and demand for all lines of tissues and toilets continues quite busy. There has been some slight improvement in demand for coated stock but the call for waxing, greaseproof, glassine and similar classes of paper is rather light.

There has been gradually increased activity among the box board manufacturing plants and one or two of the distributors report difficulty in getting prompt shipment. Price Bros. are said to be working full time, but other board plants are under 75 per cent in respect to operation. There has been but very little improvement in the paper box industry which, for the most part, is buying very little stock from the board mills.

Much Pulpwood Still in Bush

Recent advices from Kaministiquia, in Northern Ontario, state that the pulpwood market is very quiet, not one of the local or export pulp and paper companies now purchasing from the settlers, due to their requirements for the present year being more than filled. Thus the only pulpwood being shipped out is what was contracted for last spring and summer. Several settlers cut various amounts of pulpwood on their lots during the past summer and fall, expecting to be able to sell it during the present winter. At present settlers cannot sell first-class unpeeled pulpwood at a price of $6 a cord loaded on cars at Kaministiquia, so it will have to remain in the bush. Ten years ago there were buyers from every pulp and paper company in Ontario negotiating for everything in sight in the way of pulpwood at $14 a cord. The average prices per cord being paid to pulpwood cutters this season is $5 per cord.

Burt Co. Sees Signs of Improvement

Hopeful signs of improvement in general business conditions for 1931 were beginning to make an appearance, S. J. Moore, of Toronto, president of the F. N. Burt Company, manufacturers of paper boxes, paper cups and other lines, told shareholders at the annual meeting of the company in Toronto on March 29. Mr. Moore reviewed the difficulties experienced in 1930 and thought that in view of the decreased volume of business available and lower prices which prevailed, the company had come through the year in good shape. He said they were in a position to take advantage of any new business and had acquired many new accounts in 1930 to offset the decreased buying of old customers. H. C. Coppins, general superintendent, reviewed research activities of the company. The organization designs and builds its own machinery, and this was an important factor, he said, in the meeting and overcoming of highly competitive conditions. J. H. Patterson, comptroller, gave an explanation of the company's system of budgetary control and the board of directors and officers were re-elected without change.

Notes and Jottings of the Trade

It was learned at the head office of Hinde & Dauch Paper Company, Ltd., in Toronto, that the firm had completed arrangements with the Wilson Box Company, of Saint John, N. B., for the manufacture of corrugated paper boxes for New Brunswick consumption. The agreement is said to be on a royalty basis. Hinde & Dauch Paper Company at present operate in Toronto, Montreal and Trenton. It was believed that the company would open its own plant at Saint John, but this decision was discarded in favor of the present plant.

F. S. Ratcliff, head of the Ratcliff Paper Company, York street, Toronto, and Mrs. Ratcliff, have returned from a brief stay in Atlantic City.

Edward J. Thom, of the pulp division of the Howard Smith Paper Mills, Ltd., Montreal, was in Toronto last week *en route* to various points across the border in the interests of the company's bleached and groundwood products.

Fred W. Halls, head of the Fred W. Halls Paper Company, Ltd., Adelaide street, Toronto, has been spending some weeks, with Mrs. Halls, in Bermuda.

Seven of the wholesale wrapping firms in Canada have forwarded to the Prime Minister at Ottawa a memorandum stating their objections to a turnover tax, and suggesting as an alternative thereto, an increase in the present sales tax with no disturbance of business. The petitioning firms were: Walter Woods, Ltd., Hamilton; H. E. Livingston & Co.; the C. N. Syrett Paper Company, Ltd.; the W. J. Bell Paper Company; the Ratcliff Paper Company, Ltd.; Kilgours, Ltd., and the Victoria Paper and Twine Company, Toronto.

The Spruce Falls Power and Paper Company had a fine operating record for February. With three machines making news print the company's mill at Kapuskasing, Ont., established a new daily average record for the month of 413.7. This performance was accomplished without speeding up the machines beyond the 1000 feet per minute rate.

The Interlake Tissue Mills at Merritton, Ont., has purchased and is installing in its mill there a new heavy-service crepeing machine and is rebuilding the wet end of its No. 1 machine.

A recent business visitor to Toronto was T. A. Hendry, of New York, vice-president in charge of sales of the Fraser Paper Company, a manufacturing subsidiary of Madawaska. It was recently announced that all paper produced heretofore and sold to the paper merchants, and all board products, will hereafter be sold direct by Fraser Paper, Ltd., instead of through the Mead

company. The change was announced by Fraser Companies, Ltd., of Edmunston, N. B.

Harold Crabtree, president of the Howard Smith Paper Mills, Montreal, was in Toronto a few days ago attending a meeting of directors of Alliance Paper Mills, Ltd.

W. W. Cole, who for some years was manager of the Canadian Barking Drum Company at Montreal, has been appointed manager of the Carthage Machine Company of Canada, Belleville, Ont.

Canada's Pulpwood Must Beat Soviet's

[FROM OUR REGULAR CORRESPONDENT]

MONTREAL, Que., March 23, 1931.—G. C. Piche, chief of the Forest Service Department of the Province of Quebec, predicts that unless the standard of Canadian pulpwood be raised much higher than it is at present it will be forced out of the American market by Russian convict-produced wood.

Mr. Piche points out that in 1929, the United States imported 175,000 cords of Russian pulpwood, one-fifth of which was unloaded at Sorel and Three Rivers for rail shipment to that country. This wood, he says, was 100 per cent fir, was squared by plane and was of the highest quality. Additional shipments would seriously endanger the Canadian trade in pulpwood owing to the superior quality of the Russian product.

Canadian pulpwod, Mr. Piche states, is not always of the highest quality. Too often there are varieties of wood found in shipments other than fir, while much of the fir often contains many knots and foreign substances.

The high standard of Russian pulpwood has made the American buyer more critical than ever and if Canada desires to keep her pulpwood trade with the United States a standard on a par with the Soviet product must be reached, the chief of the service remarks. Another important matter he continues, is the cost. If Canada is to compete with Russia, it is necessary to lower the cost of pulpwood even below the price asked by Russia. He admits that this will be a difficult thing to do but claims it will be the only means of stopping the Russian product from entering America and thus cut off one source of funds being used by Russia for propaganda against society, religion and home.

Farmers are urged to conserve their wood lots as much as possible by cutting only that which can be replaced by normal growth.

Give Annual Shop Maintenance Course

Schlafer Hardware Company, Appleton, Wis., has just completed its Annual Shop Maintainance School. Over 200 shop men from a radius of over 200 miles attended the session held on March 10, 11 and 12.

The new developments in the field of welding were explained and taught by Fred MacDougal, engineer of the Smith Welding Equipment Company Transmission problems were taken up by W. Geist, head of the transmission department of Allis-Chalmers Company and the inventor of the Tex-Rope drive. The care, application and splicing of wire rope was demonstrated and taught by Emil Ketalo of the American Steel and Wire Company and illustrated by talking moving pictures.

I. P. Makes Improvements at Fort Edward

[FROM OUR REGULAR CORRESPONDENT]

FORT EDWARD, N. Y., March 23, 1931—Extensive improvements are now in progress at the local plant of the International Paper Company which are expected to consume several weeks for completion. Construction work on two blow vats, 36 by 31 feet with a depth of 22 feet, has also been started and a large force of workmen are being employed on the project. When completed these vats will replace the wooden vats that have been used by the company for many years. The entire program is being carried out at an estimated cost of about $35,000 and it is expected that increased production will result.

Paper Association Honors Kit Warner

The Paper Association of New York City tendered a Testimonial Dinner to Kit S. Warner, president and treasurer of the John F. Sarle Co., Inc., on the completion of his term of office as president of the National Paper Trade Association of the United States, at the Arkwright Club, last Thursday, March 26. Approximately 260 members and guests filled the banquet hall when Cliff Mallalieu, of George W. Millar & Co., the toastmaster, opened the proceedings by reading a number of congratulatory telegrams from leaders in the paper industry. Among the guests present were prominent paper manufacturers, merchants, and trade association officials.

After paying a well deserved tribute to the guest of honor, Mr. Mallalieu, also a former president of the National Paper Trade Association, introduced Clifford A. Crocker, president of the Chemical Paper Manufacturing Company and the Crocker-McElwain Company, of Holyoke, Mass., who discussed the relationship of manufacturer and merchant, and also spoke feelingly of Kit Warner, whom he declared he had known and loved for many years.

Emmett H. Naylor, secretary of the Writing Paper Manufacturers' Association, added his eulogy of the guest of honor and declared that men like Mr. Warner could always be counted upon for sound constructive thinking. He was followed by Julius Tannen, who discussed current topics in a humorous vein and told several anecdotes of his stage experiences, which created roars of laughter.

Judge Mortimer W. Byers, former council of the national association, also expressed his appreciation of the admirable qualities of Mr. Warner and on behalf of the members of the Paper Association of New York City, presented him with a handsome electric clock as a token of their admiration and friendship.

Mr. Warner expressed his deepest thanks for the great honor bestowed upon him in a few well chosen words. He also took occasion to render a fitting tribute to Charles Addoms, of the Miller & Wright Paper Company, treasurer of the national association, for his loyal and invaluable support during his term of office.

At the annual meeting of the Paper Association of New York City, which was held before the banquet, the following officers were elected for the ensuing year:

President, Oswald S. Marquardt, Marquardt, Blake & Decker, Inc.; vice-president, Fine Paper Division, Robert Schmidt, Miller & Wright Paper Company; vice-president, Wrapping Paper Division, Richard Bauer, Richard Bauer & Co.; treasurer, H. B. Thurston, Conrow Bros.; secretary, Irwin Slote, 41 Park Row.

Directors Fine Paper Division—George McKinney, F. A. Flinn, Inc.; E. M. Whitehead, Whitehead & Alliger Company; Bertram E. Linde, J. E. Linde Paper Company; Robert McGrath, Joseph I. Grady & Co.; J. Harry Londergan, Henry Lindemeyr & Sons; Max Greenbaum, Beekman Paper and Card Company.

Directors Wrapping Paper Division—Richard C. Kettles, Chas. F. Hubbs & Co.; James F. Levens, Geo. W. Millar & Co.; Elwin Walker, Walker-Goulard Plehn Company; William E. Ebbets, Coy Disbrow & Co.; Geo. W. T. Skinner, Skinner & Co.

Receivership for Willapa Co., Denied

PORTLAND, Ore., March 27, 1931.—The suit brought recently by P. K. Mayers and V. K. Sturges, Portland, asking receivership for the Willapa Pulp and Paper Company, was denied by Circuit Judge Tucker March 20, in that city.

The plaintiffs charged that the corporation organized under the laws of Oregon in 1927, at one time had $700,000 in their treasury but that funds had been dissipated until now only $14,500 remains. Assets estimated at more than $500,000 are said to be involved in the request for a receivership, including a mill and timber properties and docks in Pacific county, Wash.

Wisconsin to Preserve Its Pulpwood Supply

Federal Forest Commission Gives Final Approval to Establishment of Tree Nursery At Rhinelander—Will Be Largest In United States, Producing Fifteen Million Seedlings Annually for Transplanting to Various Forest Units In State

[FROM OUR REGULAR CORRESPONDENT]

APPLETON, Wis., March 30, 1931—In line with the extensive program now in progress for the preservation of the pulpwood and timber supply of Wisconsin, the federal forest commission has given final approval to the establishment of a tree nursery of twenty acres at Rhinelander, Wis. It will be the largest in the United States, producing 15,000,000 seedlings annually for transplanting to the various federal forest units in the state. All of the land was donated to the government by Oneida county, in which Rhinelander is located. R. U. Harmon, forest supervisor, is arranging for immediate work on the project, and the work will be in charge of H. Basil Wales, assistant regional forester, and G. Willard Jones, of Montana, nursery expert.

Two acres of land already cleared have been loaned to the nursery so planting can be started at once and a supply of seedlings made available by the fall of 1931. The first planting will be Norway pine, and spruce, consisting of about 10,000,000 trees. As soon as the remaining land is cleared, planting will be conducted in three year cycles.

Work is also under way on roads in the Moquah unit so as to give quick access for fire protection. Three steel lookout towers each 85 feet high also will be put up at once. Each tract of 160 acres will have a fringe of hardwood to serve as a fire break. An appropriation of $72,500 has been made available for this work, of which $40,000 will be spent immediately as a means of unemployment relief.

In this connection a bill has been introduced in the Wisconsin legislature requiring logging companies to dispose of slash within one year after a cutting of timber. An area of fifty feet on each side of roadways must be cleared of slash; likewise, it must be removed from the vicinity of all tracts containing valuable timber. The slash may be burned under permit from the state conservation commission, or may be scattered or hauled away. By this precaution, it is expected that many of the fires caused by locomotive sparks, smokers' and campers' carelessness and other causes may be avoided, resulting in minimizing the source of the greatest timber loss annually.

J. H. Hudson Addresses Safety School

J. H. Hudson, of Chicago, staff member of the Illinois Chamber of Commerce, was the speaker at the closing dinner of the safety school at Marinette, Wis., last week. There was an attendance of nearly 300. Mr. Hudson's subject was "Using Your Head in the Upbuilding of Your Community." He emphasized the value of safety not only in industry but in the community as a whole. A. B. Hansen, acting manager of the Marinette & Menominee Paper Company, acted as toastmaster. The school had an enrollment of 469 for the season, with large representation from the Marinette & Menominee Paper Company, the Badger Paper Mills, Inc., and other institutions.

Wisconsin River Pollution Hearings

Further hearings on the pollution of the Wisconsin River were held at Madison, Wis., last week, by the state railroad commission, with paper mill representatives from that locality taking part. The subject had been taken up in detail at a three-day session at Merrill, Wis., and the concluding session was held after further data had been obtained. Mills will work with state interests further to eliminate conditions which sportsmen claim are destroying fish. The value of the industries overshadows these other features, it was pointed out, and the mills therefore are not the object of punitive measures for a condition they themselves are trying to alleviate.

Fox River Navigation to Start Early

Boat shipments of coal to paper mills along the Fox River will be started earlier this year than usual. Because of the mild winter and the early break up of the ice, navigation will start officially on April 1. This brings considerable relief, since low water conditions have made the use of steam power very extensive during the winter. Spring storms have been frequent and will help to replenish the water supply so as to relieve a serious outlook this summer.

On the Wisconsin River there is also a serious shortage of water. No sluicing will be done this spring even though there may be prospect of some flooding, since it is necessary to conserve the water supply to the largest extent possible.

News of the Industry

Development of the George Banta Publishing Company, of Menasha, Wis., was described in an address given by George Banta, Jr., vice president, at a luncheon of the Menasha Rotary club recently. The business was started by George Banta, Sr., in his home many years ago, the speaker said, and a commercial business was built up which now utilizes a force of 375 workers operating on a 24-hour schedule.

Another address of interest was given by F. G. Kilp, chief forester of the Nekoosa-Edwards Paper Company, Nekoosa, Wis., at a Kiwanis club luncheon at Wisconsin Rapids, Wis. Mr. Kilp told how his company pioneered in forestry as a means of perpetuating its timber supply, until it now has 5,000,000 trees under cultivation with marked success.

An inheritance tax of $115,000 was paid last week to Winnebago county, Wisconsin, on the estate of Harry Price, late secretary-treasurer of the Kimberly-Clark Corporation, Neenah, Wis. This was the largest tax ever paid to the county.

Two deaths of paper mill workers occurred during the last week. Henry Ritten, of Menasha, Wis., died at the age of 54 years, after being employed at the John Strange Paper Company of that city for 24 years. He was night superintendent for thirteen years. The other was Chester M. Patterson, of Kaukauna, Wis., age 65, who was a millwright for the Thilmany Pulp and Paper Company.

Hammond Bag & Paper Co. Files Complaint

WASHINGTON, D. C., March 18, 1931.—The Hammond Bag and Paper Company of Wellsburg, W. Va., has filed a complaint with the Interstate Commerce Commission against the Atlantic Coast Line Railroad Company. The company claims unjust and unreasonable rates are effective on shipments of paper bags, in less than carloads, from Wellsburg to point in Alabama, Georgia and Tennessee and asks for a cease and desist order, the establishment of just and reasonable rates for the future and reparation.

The Commission has rendered its decision in the case of the National Paper Box Company against the Chicago, Rock Island & Pacific Railway Company. In their syllabus in this case the Commissioners say:

"Cores or tubes, made of chipboard and waste paper, in boxes in less than carloads, from Kansas City, Mo., to Monticello, Ind., found subject to ratings of one and one half times first class, under western and official classifications. Applicable ratings and rates found not unreasonable. Complaint dismissed."

Demand for Paper Is Improving in Chicago

Paper Distributors of Practically All Standard Grades Are More Optimistic Than for Some Time Past—Request for Higher Grades of Fine Paper Well Sustained—Lower Grades Slightly Firmer—Wrapping Paper Moving In Better Volume

[FROM OUR REGULAR CORRESPONDENT]

CHICAGO, Ill., March 28, 1931—Indications are that there is more optimism in reports from various paper offices this week than there has been for a long time. This tinge of hope seems to cover practically all lines, even to those who have been so sadly depressed in the last few months. A firming up process is going on and it is expected that each "firming up/process" means less chance for another price cutting debacle.

Fine Papers Doing Well

In the fine papers, the highest grades are said to be doing very well, with orders being placed in sufficient quantity to warrant some belief that a slight turn has come. In the lower grades of fine papers the market has firmed, though some tendency to cut prices here and there is noticeable. In books and covers no change is noted over last week. Kraft specialities are said to be noticeably improved and the kraft business in general—although mills are reported to be running cut time—looks stronger than for some weeks. Jobbers in Chicago report a fair retail demand that is constantly improving.

The board market here continues to watch with interest the activities of the Container Corporation. Curtailed production in the market in general is helping to firm up conditions materially. Waste papers are following the trend of general business with the better grades reported the strongest of the lot.

Chicago Paper Merchants Meet

Members of the Chicago Paper Association at their regular meeting on March 24 heard the entire report of the auditing firm which has been assigned to the task of investigating the business status of member firms. The composite report, according to statements given out, indicates that Chicago paper jobbers are not coming near to a fair return on their investment, responsibility and everything else. A part of this difficulty, says the report, is due to present slow business, but another part is also due to various ways of doing business not conducive to profit making. The giving of the report took up the entire meeting and the members of the association will give it a thorough going over at the next few regular get-togethers. The reports were said to be not encouraging and it seems evident to the members that a general house cleaning should be in order.

At the same time the association announced that it would hold its annual salesmen-member banquet at the Medinah Athletic Club on April 14. This event, which brings together executives and salesmen of all member companies, is one of the most important of the entire year. The program will feature entertainment of various and sundry sorts. William J. Shapland, of the Fred Rentz Paper Company, is the chairman of the banquet committee.

Paepcke Management Sustained

Stockholders of the Container Corporation of America at their annual meeting here today registered a strong vote of confidence in the present Paepcke management, over three-fourths of the votes cast being for the board of directors proposed by the management. The board proposed by the Brunt group, who have been waging a proxy fight, polled but a minor fraction of the entire vote cast, the banking groups throwing their votes with the Paepcke management.

Directors elected at the annual meeting were: Sewell Avery, president of the United States Gypsum Company; William R. Bassett, partner of Spencer, Trask and Company; Walter P. Paepcke, president of Container Corporation; E. R. Hankins and F. G. Becker, vice-presidents of Container; H. B. Clark, representative of Sefton stock interests, and Charles W. Seabury, vice-president of Marsh and McLennan.

At a subsequent directors meeting by-laws of the company were amended to increase the board of directors from seven to eleven. Four additional directors named by the board were William P. Jeffery, of Jeffery and Redmond, Industrial Engineers of New York; George Meade, president of the Meade Pulp & Paper Company; George Greene, partner of E. H. Rollins and Company, New York, and Wesley M. Dixon, vice-president of Container.

Officers of the company were reelected by the board of directors with the exception of J. P. Brunt, executive vice-president.

Commenting on the action of the stockholders at today's meeting, which was held over from yesterday to enable a count of stockholders proxies, Walter P. Paepcke, president, said: "We are naturally very much pleased at the overwhelming vote of confidence given our management by the stockholders. The intense interest which stockholders took in today's election of directors is witnessed by the fact that all but a few thousand shares of our common stock were voted. We feel that our new board of directors is an excellent one, with seven representing outside banking and other interests and four executives of the Container Corporation."

John Wesley Addresses Paper Salesmen

John Wesley, sales manager of the Rhinelander Paper Company, was the speaker at the regular Monday meeting of the Mid-Western Division of the Salesmen's Association of the Paper Industry on March 23. The discussion was one of a series given by member salesmen themselves on their products, history of the product, conditions in the field, etc., Mr. Wesley based his talk on a discussion of glassines and grease proofs and had a number of actual samples of pulpwood and other various ingredients to illustrate the development of this company's product from the raw material to the finished product. Mr. Wesley explained the procedures followed and, all in all, provided the large number of salesmen present with a very interesting discussion. No speaker has been scheduled for the March 30 program but the series will probably be continued on the Monday following that.

Finnish Pulpwood for Corinth Mill

[FROM OUR REGULAR CORRESPONDENT]

CORINTH, N. Y., March 30, 1931.—The arrival this week of several thousand tons of Finland pulpwood at the local plant of the International Paper Company has relieved a situation which threatened to curtail operations. The cargo was shipped through the Port of Albany and about fifteen freight cars were used in the last stages of the journey. Low water conditions have caused a shortage of raw materials at the plant in this village for some time past but under new arrangements it is expected that the company will now receive in the neighborhood of fifty carloads of pulpwood weekly.

Surplus stocks of pulpwood have nearly been exhausted at the local plant and only a scant supply remains from the huge stacks piled up about a year ago. It was also learned that only a few of the grinders are in operation because of being handicapped by low water and it is believed that only heavy rainfalls can relieve the existing difficulties. The new Conklingville reservoir has aided greatly during the drought period and undoubtedly many Northern New York paper mills would have been forced to curtail operations if these impounded waters were not used.

An Old Timer's Reminiscences

By Joseph H. Wallace, Pres, Joseph H. Wallace & Co.

(Continued from last week)

This harangue started in January and we are beginning to worry lest our audience will be reminded of that old song in Billee Taylor that says:

"To sing all night is injudicious
The public's heart's not made of stone,
And besides I'm not ambitious
To give the whole damn show alone."

And if you read these chapters and don't like them or don't believe them, or think we are losing our minds if any, we don't blame you and we suggest that you write to the editor of PAPER TRADE JOURNAL and give him your views as he likes to have the space filled cheaply as you may have noticed. *But*—as a swan song on Europe in Pre-War days and New Orleans in Pre-Volstead Eras, we want to say that you missed something, and we like to look back on those experiences and acquaintances.

Years To Remember in Europe

The years, 1910 to 1914 were something to remember in Europe if one was taken into the homes of representatives of all parts of Western Europe while each nation still retained some of its national characteristics. I once had an aunt in New England who said she didn't like Swedish people. When asked which ones, she said, "Our girl is Swedish and she is careless of her appearance and has no taste in clothes." And I have seen a lot of my own countrymen running about Europe ridiculing everything that was unlike their own backyard in Peoria. While you fellows were "over there," making it safe for democrats, it was different, and so I feel sorry that you won't ever know what a treat it used to be, when Germans were always drinking to the toast "der Tag," doing the goose step, and preparing. At Fürstenwalde, near Berlin, while purchasing digesters, diffuseurs, etc., we saw some welding of shapes that resembled bows and sterns rather than tanks, etc. On mentioning *boats,* my guide registered terror and then ridiculed us, *but* we were hustled out of the place. Having "hobbied" boats for years, some of which were spent in the United States lighthouse service, and having studied naval architecture as a pastime, and having bought a boat that couldn't win races and rearranged it so that it won forty cups in three years—including Sir Thomas Lipton's Viking Trophy three times, and finally having egotism, we believed we knew boats when we saw them and we still believe it. "Sir Tommy" stands out as one of the grandest characters of our acquaintance and we have always been as anxious to have him win "that auld Mug" as he is to win it, and that is some!

Willis Howes, a Genius and Artist

Speaking of yacht races reminds us—the yacht race in 1895 was Defender vs. Valkyrie. Early that year Willis Howes made a new product at Niagara Paper Mills at Lockport, N. Y. A printer began using it as a cover paper and so Howes began making it in colors. He called it "Defender" because of the ripples. In New York he sold a ton to Charlie Hubbs at 6 cents a pound and had to agree to take back half of it if it didn't go! In Boston next day, Mr. Carter of Carter, Rice asked the price. Howes said "I want to market this to the largest jobbers at 10 cents per pound, *resale price* 15 cents a pound, discount 10 per cent, resale 15 cents lots of 600 pounds, discount 10 per cent and offered Carter exclusive sale in New England for an order for $1000 worth. He accepted and so Howes initiated resale prices. Howes was and is a genius and an artist and he thinks he's a bridge player—don't you, old man? George W. Knowlton was foolish like a fox when he took Howes into Knowlton Brothers. Their continued success proved that.

D. Clark Everest, a Young General Manager

I once asked James A. Kimberley if he would allow me to use as a thesis for an advanced degree in engineering the rearrangement of the plant at Niagara, Wisconsin, particularly "the solution of some of the difficulties." He replied "no objection if you will promise not to mention me, among the difficulties," and feeling that he was right we have refrained from saying some things about certain people in no uncertain manner. So far we have resisted many temptations and we feel rather proud. I was once asked by a client to recommend a big paper man as general manager. I told him that I once came across a very old young man acting as assistant to a manager in a mill we built. This young man knew where to find whatever was wanted, and what to do with it. Then he left that mill because they knew his age and judged him accordingly. Then he was given a big job to build a mill and became its general manager. One day one of the owners noticed that the assistant manager was rather young for so important a position and commented on the fact. The general manager admitted that *32 was* young for an assistant manager but "he is an unusually, reliable young man." After the owner left the general manager said to a friend "I'm *26*!" But he looked and acted older so they hadn't noticed it. His name was D. Clark Everest! He looks about the same now too! One night in a sleeper a Hebrew who had been trying to sell Everest some merchandise opened a story with "I know a good Jewish story, if Mr. Everest would take no offence!"—

Ed Backus once asked me who would be a good man to get as general manager at International Falls, Minnesota. I said "Why don't you *give* Clark Everest a half interest in your property?" "Why?" said Backus—"Well," I retorted "if you and Everest were partners you would soon *be* the paper trade, and so it would pay you handsomely." But he didn't do it. I sure was glad he didn't.

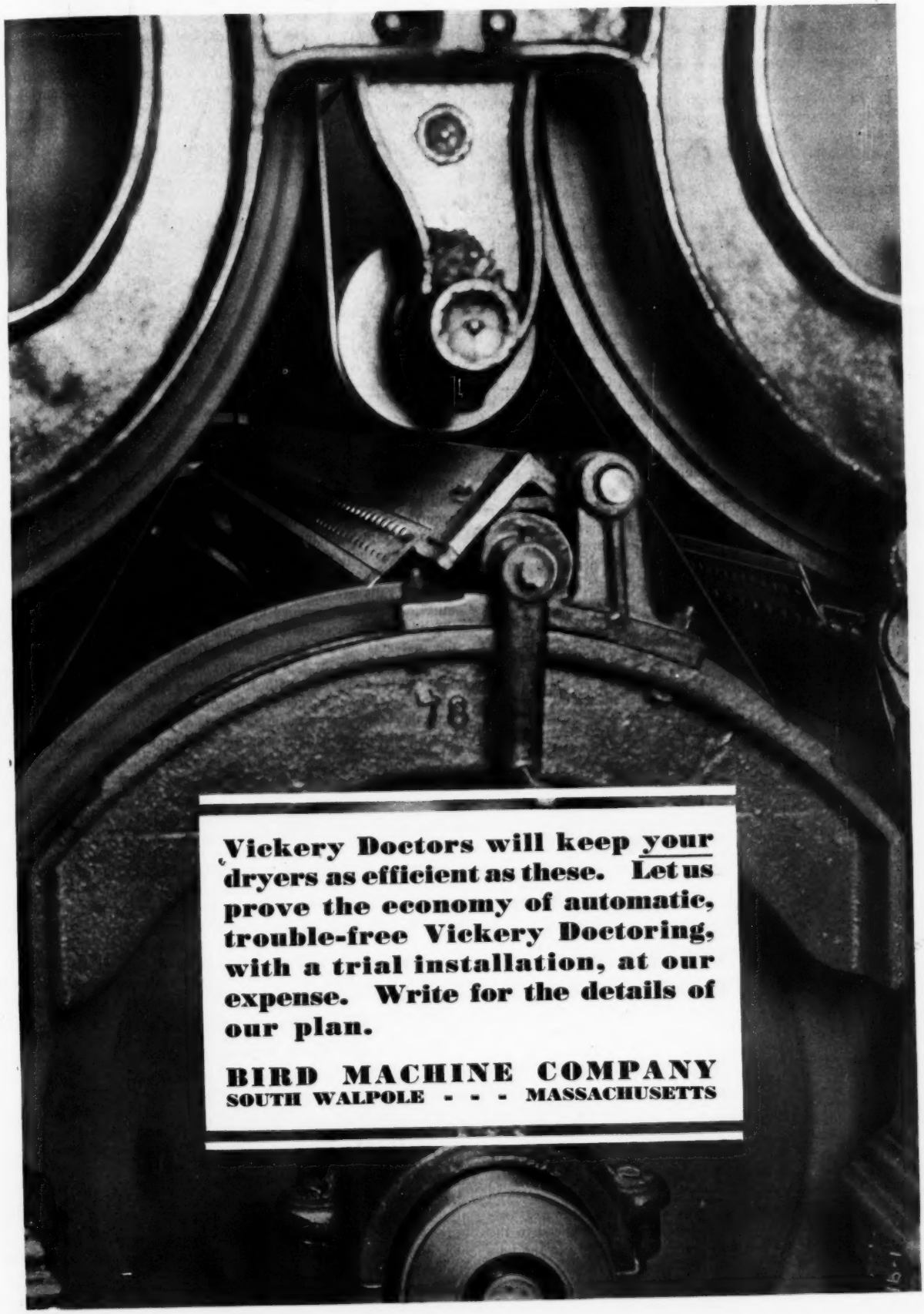
Dick Had a Hell of a Time

When we built the Southern Paper Company mill, it was near New Orleans and New Orleans before Volstead had a character of its own. The writer was indeed fortunate in securing Ed Mayo to manage this mill, Adolph Waern and Frank Greenwood to help put it together and start it up and Dick Laftmann, then a young Swedish chemist as superintendent of the fiber mill. When Dick was first there, his English was sometimes amusing. On being entertained by some Southern ladies he thanked them profusely, exclaiming, "I've had a hell of a time." Dick denies this, but we can get witnesses to prove it, and Dick blushes when he denies it, so there you are.

After the Southern Paper Company plant became successful, we had so many reports to make in various locations for future sulphate mills that the South Atlantic and Gulf states are practically covered by data collected in examinations from Virginia and the Carolinas to Texas inclusive. There are some wonderful locations still undeveloped in the South, and there are lines of product that we believe are as attractive as kraft paper was in 1910—before it was so thoroughly overdone.

Joined Hands With Reids of Newfoundland

When Thomas L. (Carbide) Willson and the MacKenzie-Mann interests sold the Saguenay power properties to *the Duke* of North Carolina, he looked for more possibilities and joined hands with the Reids of Newfoundland. This combination kept us busy for over two years and the Corner Brook development at the mouth of the Humber River, Bay of Islands, Newfoundland was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Vickery Doctors will keep your dryers as efficient as these. Let us prove the economy of automatic, trouble-free Vickery Doctoring, with a trial installation, at our expense. Write for the details of our plan.
BIRD MACHINE COMPANY
SOUTH WALPOLE - - - MASSACHUSETTS

sold to British interests as a result of these investigations. This property is now one of the important plants of the International Paper Company.

The miniature sulphate mill which was set up in the mill of Southern Paper Company and run parallel to the big mill from 1913 to 1916 was moved to our laboratory at Stamford, Connecticut in 1916 and for several years operated on tests of fibre possibilities from all points. These tests included a large program for the Ordnance Department, United States Army, with respect to fiber for explosives. When this country entered the war the writer and his associates were taken over into Explosive Section of Ordnance under the direction of David C. Jackling, one of the big $1.00 a year chiefs, who volunteered to help direct things. It was a privilege to work under his direction, and in his department there was an absence of red tape that was most refreshing. Next week we will tell of the war work with which we were associated.

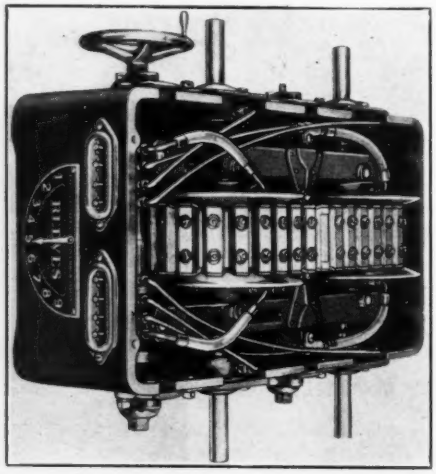
(To be continued)

New Enclosed Design Reeves Transmission

The New Enclosed Design Variable Speed Transmission, recently announced by Reeves Pulley Company, Columbus, Ind., embodies radical improvements over previous Reeves enclosed designs, and offers definite advantages to buyers of variable speed-control equipment. This new development is an important addition to the complete line of Reeves variable speed transmissions.

In this new unit, the standard internal operating parts of the Reeves transmission are totally enclosed in a compact, neat and symmetrical cast iron case. The enclosure meets all modern requirements for attractive lines in industrial equipment and is of practical design and sturdy construction. It affords complete protection in all machine applications where the operating parts of the transmission must be guarded from water, live steam, chemical fumes or abrasives.

Easy access to the internal operating parts is provided by U-shaped recesses in the sides of the bottom section of the case which permit the removal, as a unit, of the operating parts, including the bearings of the two shafts as well as the shifting and



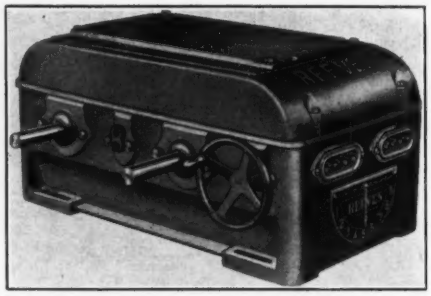
SHOWING "CENTRALIZED" LUBRICATION

belt tightening screws. Removal of the lid from the cover section permits minor adjustments, inspection of the internal operating parts, or installation of a new V-belt.

Outstanding among the features of the new Reeves enclosed transmission is the improvement in lubrication facilities. Complete lubrication of all bearings is accomplished through force feed fittings, located in two recessed panels at one end of the Transmission. From these eight fittings rigid copper tubes lead to the four radial shaft bearings and flexible copper tubes lead to the four thrust bearings fittings around the disc hubs. By means of openings from the thrust bearings, the lubricant is also forced into the spiral grooves of the disc hub bores, thus thoroughly lubricating the disc hubs, shafts and driving keys.

By making lubrication easy and convenient, this centralized system eliminates all possibility of neglecting this important maintenance detail. Each transmission is shipped with all bearings and connecting tubes thoroughly packed with lubricant. After the transmission is in service lubrication is necessary only once in every 30 to 45 days, depending upon the type of service.

The new enclosed design Reeves is built in six sizes, covering



NEW DESIGN REEVES TRANSMISSION

requirements from fractional to 10 horse power in all speed ranges, and can be mounted on floor, ceiling or in vertical position, as the requirements of the installation demand. The cover section accommodates adjustable motor rails and cross rails on which a complete motor unit or auxiliary countershaft unit may be mounted for varying requirements of machine-speed control.

These rails are bolted to each side of the transmission cover, outside the space occupied by the lid of the cover section, leaving the lid entirely accessible for removal. The cross rails on which the motor is mounted are also slotted for adjustment, and will permit any design or type of motor of the proper horse power requirements, consistent with the size of the transmission, to be mounted. The new enclosed design Reeves transmission is a remarkably compact and efficient unit, adaptable to practically any speed-control installations where special protection is required.

Racquette River Produces New Line

[FROM OUR REGULAR CORRESPONDENT]

POTSDAM, N. Y., March 30, 1931—Experiments carried out by the Racquette River Paper Company within the past few months have resulted in the marketing of a new line of fine vellum envelopes and paper. The line is designed especially for the higher grade stationery trade and is said to be meeting with a good response. While the production is confined to the local plant it is understood that the finishing operations are being carried on elsewhere. The development of the new line has been largely instrumental in keeping the plant running on full time weekly schedules for some time. The company employs several hundred workers and has retained its entire force during the recent dull period.

Get Verdict Against Holyoke Water Power Co.

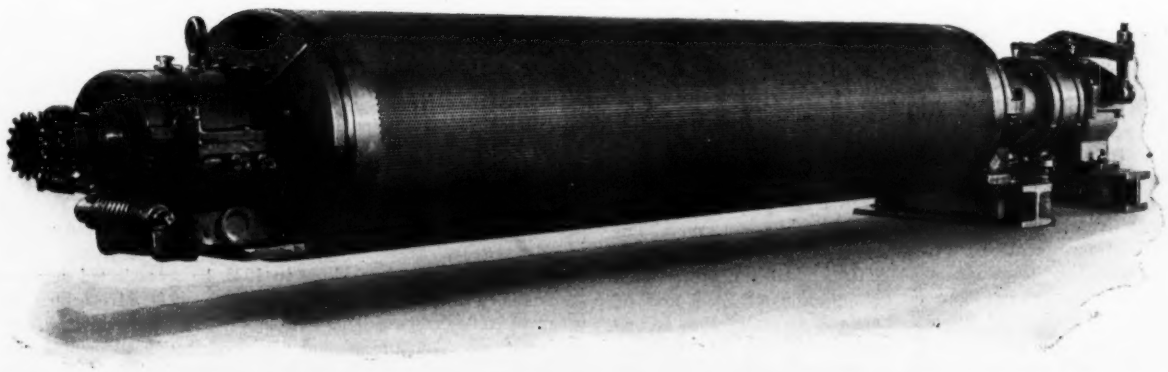
[FROM OUR REGULAR CORRESPONDENT]

HOLYOKE, Mass., March 30, 1931—A verdict of $2700 was handed down in the Hampden County Superior Court last week by Judge W. H. Whiting in the case of Edward P. Bagg against the Holyoke Water Power Company. Mr. Bagg who is head of the Parsons Paper Company was also heavily interested in the Holyoke Silk Hosiery Company which bought a lot of land in 1922 from the defendant company and erected a mill there. The claim against the defendant company was due to the alleged fact that the land was filled in land necessitating a large expense for the laying of the foundations for the mill. The plaintiff asked for $10,000 and accrued interest at 6 per cent since 1922.

CANTILEVER

Downingtown Suction Rolls are built in both Cantilever and Standard Types, with suction pump connection on either front or rear. All rolls are fully adjustable while running. This includes the packing strip adjustment, deckle adjustment and adjustment of angular position of the suction box. Furthermore, when the roll is idle, the packing strips can be removed through ports in the end heads, without removing the suction box, or dismantling the roll in any way. A complete description of the Downingtown Suction Roll and its advantages is contained in our Catalog 103. Write us for a copy and a list of concerns using this improved type of suction roll.

DOWNINGTOWN MFG. CO.
DOWNINGTOWN, PA.



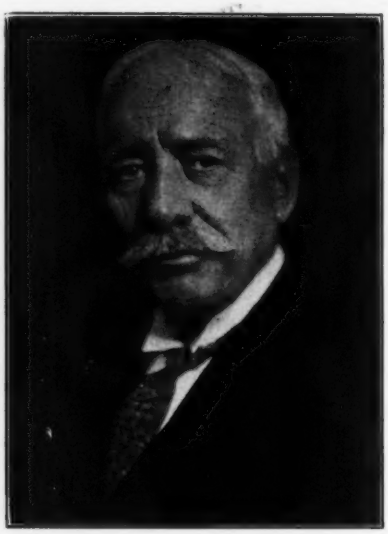
Obituary

William Anderson Castle

The paper mill supply industry suffered an irreparable loss when William Anderson Castle, president and treasurer of Castle & Overton, Inc., 200 Fifth Avenue, New York, passed away suddenly on Saturday, March 21, at Del Monte, California, where he was enjoying a vacation. He was in his seventy-third year. Death was attributed to heart disease.

Mr. Castle started in business with his father Henry M. Castle, at Springfield, Mass., in 1873 and at his father's death succeeded to his business. He was therefore identified with the industry for 56 years.

In 1894 he formed a partnership with Leon Gottheil, who since 1888 had been the sales representative in the United States for several leading European importers of rags. Mr. Gottheil also at that time had the sole agency in the United States for the celebrated Waldhof pulps manufactured by Zellstofffabrik-Waldhof, of Mannheim-Waldhof, Germany, and this agency he brought with him to the new partnership under the title of Castle & Gottheil.



WILLIAM ANDERSON CASTLE

The business was continued until 1901 when Frank C. Overton joined the partnership and the name was changed to Castle, Gottheil & Overton. Mr. Overton started business in 1886 with his father, R. H. Overton, who had established his own business in paper mill supplies in 1879. The firm of R. H. Overton & Son was liquidated in 1901, when Mr. Overton associated himself with Castle and Gottheil.

The firm of Castle, Gottheil & Overton continued until the death of Mr. Gottheil in 1922, following which the name of the firm was changed to Castle & Overton and in 1924 the business was incorporated under the name of Castle & Overton, Inc.

Castle & Overton have for many years been known as one of the leading factors of the paper mill supply industry, both in the United States and abroad. The corporation has branch offices and representatives in Chicago, Philadelphia, Holyoke and several important European centers.

As the United States agents of Zellstofffabrik-Waldhof, which has a daily production at present of approximately 1000 tons of bleached and unbleached sulphite, Castle & Overton, Inc., is one of the principal importers of European pulps and also deals in practically every description of raw materials consumed by the paper mills including rags, bagging, old rope and paper stock.

Mr. Castle was well known in the paper industry as a gentleman of unimpeachable and unassuming character and was loved and respected by all with whom he came in contact. In recent years, although regularly attending to his business, he had devoted most of his time and energy to his personal affairs, while leaving the conduct of the business with his younger associates. He is survived by two brothers and a sister, his wife having died several years ago.

William B. Page

[FROM OUR REGULAR CORRESPONDENT]

FITCHBURG, Mass., March 16, 1931—William B. Page, associated for many years with the George W. Wheelwright Paper Company and prominent in the business and social life of the city, died at Burbank Hospital early today at the age of 60 years, following a long illness.

Mr. Page was born in this city June 7, 1870, the son of Henry T. and Margaret Allen (Brewster), and was a descendant of Robert Page of Salem. He attended the public schools and was graduated from high school in 1889 after which he attended the Massachusetts Institute of Technology at Boston.

In August, 1891, he became associated with his father in the management of the George W. Wheelwright Company paper mills in this city, Leominster and Barre, filling various executive positions until his retirement a few years ago as treasurer.

Mr. Page was associated with the Crocker Realty Company and was treasurer of the Nashua River Reservoir Company. He was much interested in social work and was treasurer of the Wachusetts Children's Aid Society and served as president and clerk of the Family Welfare Association.

Since his youth he was a member of Christ Church and served for years as usher and as vestryman. He was a member of the Fay Club, Oak Hill Country Club, Monoosnock Country Club, Legion Club and the Technology Club.

He was a trusteee of the Burbank Hospital and a member of the medical committee. He was also a director of the Worcester County National Bank.

Mr. Page married Mary Hayes Huse of Newburyport, December 10, 1902. Her death occurred May 31, 1912, and in November 27, 1918, he married Dorothy Beeber of Westchester, who with their daughter, Barbara, survives.

Philip O. Schleussner

Philip O. Schleussner, 53, first vice-president of the Roessler & Hasslacher Chemical Company, Inc., New York, and an active figure in the drug and chemical industry for over 25 years, died on March 21 at his home, "Wood Acres," Stamford, Conn. He had been ill with bronchial pneumonia since last November. Private services were held at "Wood Acres" on March 23, interment taking place at Woodlawn Cemetery.

To his many friends in the chemical industry both here and abroad, Mr. Schleussner was always an interesting personage. A genial disposition and kindly interest in his fellow men won for him a host of friends.

Philip O. Schleussner was born in Brooklyn, N. Y., on September 6, 1878, the son of Charles and Ida Schleussner. A public school education was followed by a few years of work in the textile industry. His next position was with the Heyden Chemical Works, New York. He left this company in 1906 to take charge of the Platinum Division of the Roessler and Hasslacher Chemical Company, New York. He was then 28 and just starting to show some of the ability which in the next fifteen years of association with Roessler & Hasslacher carried him to the position of manager of sales for all the company's products. Other advancement followed rapidly. In 1923, he was elected secretary and made director of the company and in 1929, Mr. Schleussner became first vice-president. Along with these activities, Mr. Schleussner was an official and director in other associated companies of Roessler & Hasslacher. These included the Perth Amboy Chemical Works Division, Perth Amboy, N. J., the Cia

TENSILASTIC RUBBER ROLLS serve 30% to 40% longer between grindings

Every machine man knows that a single grinding wears a roll down more than months of actual service. Yet, grinding *must* be resorted to occasionally in order to restore the surface and balance which have been disturbed by the steady strain of production.

* * *

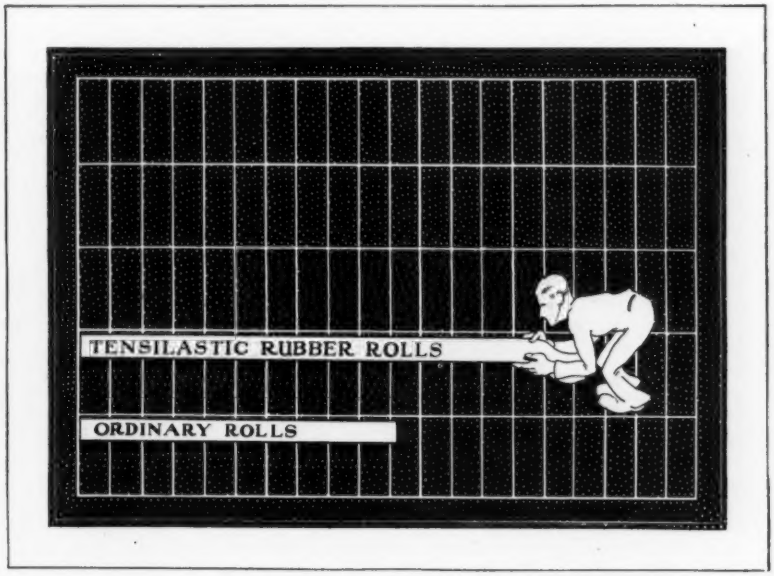
How gratifying, then, both from the operating and economic standpoints, to find rolls that serve 30% to 40% longer between grindings than you'd ordinarily expect.

* * *

Tensilastics do just that ... and more. While four months is considered good performance with ordinary press rolls, a recent report tells of a Tensilastic Rubber Press Roll that ran *16 months* before grinding was thought necessary. Even then, examination showed the crowning still true and a difference in caliper of only .018 between the ends.

* * *

Another, on a high speed kraft machine, served a full year and three days without attention before being lifted from the journals. Again, Tensilastic Rubber Table Rolls examined ten months after installation were still in perfect condition, with the prospects of grinding far in the future.



* * *

Stability, service, ability to stand abuse, are built into Tensilastics by special processes and strict laboratory control of every stage of manufacture. Tensilastic Rubber Rolls,—in table, press, couch, breast, wire carrier and stretch positions,—meet paper making needs perfectly. And, due to their exceptional resistance to oxidation, Tensilastics may be stored in reserve for long periods without deteriorating.

* * *

Equip your machines with Tensilastics,—they'll give you more undisturbed time to devote to the business of making paper.

ROLL LIFE INSURANCE

Grind rolls straight before placing in storage. Crown just before reinstalling on machine,—giving you a freshly ground roll to put in.

"Density and Crowning of Press Rolls"
and
"The Use and Abuse of Rubber Rolls"
Two booklets full of helpful roll hints.
Write for copies.

American Wringer Co., Inc.

Rubber Roll Specialists for More Than 40 Years

33 No. La Salle St., Chicago — Woonsocket, Rhode Island — 461 Eighth Ave., New York

Pacific Coast Representative: Walter S. Hodges, Lewis Bldg., Portland, Ore.

CANADIAN FACTORY: FARNHAM, QUEBEC

TENSILASTIC
RUBBER ROLLS

T13

Mexicana de Productos Quimicos Roessler & Hasslacher, Mexico. He was vice-president and chairman of the executive committee of the Niacet Chemicals Corporation, Niagara Falls, N. Y.

Mr. Schleussner was keenly interested in horses, maintaining a stable of his own. At one time he was also Master of the Hounds of the Oxridge Hunt Club, Darien, Conn. He was for years a prominent member of this club and many others including the Lotos Club of New York, the New York Athletic Club, Woodway Country Club, the National Republican Club, and the Chemists Club.

At the time of his death he was treasurer of the Manufacturing Chemists' Association.

He is survived by his mother and father, his wife, the former Matilda Kaeppel of New York, a daughter, Geraldin and a son, Charles.

Joseph L. Wyckoff

[FROM OUR REGULAR CORRESPONDENT]

HOLYOKE, Mass., March 31, 1931—Joseph Lewis Wyckoff, 67, died Thursday night, March 19, at his home 2040 Northampton street. He had been in poor health for the past two years but had partly recovered and was able to be at his office every day of late months, his death being unexpected.

Mr. Wyckoff, who was born in Perry, N. Y., came to Holyoke in 1891 and joined the Smith & White Company, then a small concern. Two years later Mr. Wyckoff and Edward N. White bought out F. D. Smith's interest and the period of expansion and enlargement that was to last for nearly forty years was begun. The concern was incorporated as the White & Wyckoff Manufacturing Company.

Mr. Wyckoff was president during all the period until his death, and Mr. White was treasurer.

The concern developed steadily from the time of its reorganization. The first enlargement came in 1893, again in 1898, in 1910, 1916 and 1919 and today it constitutes three modern fully equipped manufacturing plants with 170,000 square feet of floor space. Under its own roof it performs all the operations necessary to produce boxed paper, having for example one of the largest printing plants in Holyoke.

Mr. Wyckoff was for twenty years president of the Mount Tom Golf club in which he took great interest, this being for years his chief interest outside of his business.

Mr. Wyckoff was fond of traveling and took a number of trips to Europe and around the world. It was on the last of these that he was injured in an auto accident in California from which time he dated his ill health. He was a member and "booster" for the Holyoke Chamber of Commerce, was a director of the Hadley Fall Trust Company and trustee of the Holyoke Savings Bank, and affiliated with the Second Congregational Church.

He was a 32d degree Mason and member of the following organizations:

Megantic Fish and Game Corporation, Alden Kindred of America, Society of Mayflower Descendents, Holland Society of New York, Country Club of Springfield, Mount Tom Golf Club, Silver Lake Country and Golf Clubs, Pelican Club of Boca Grande, Fla., Conn. Valley Consistory, (Knights Templars), Mount Nonotuck Lodge, A. F. & A. M., Melba Temple, A. A. O. N. M. S., Holyoke Council, R. & S. M., Massachusetts Consistory, 32d Degree, Conn. Valley Historical Society, St. Andrew Commandery, Evening Star Lodge of Perfection, Massasoit Council, Princes of Jerusalem, Springfield Chapter of Rose Croix, Mount Holyoke Royal Arch Chapter.

Besides his wife he leaves one brother, Newton, head of the Wyckoff Knitting Company, of Perry, N. Y., and several nieces and nephews.

The funeral was held at the home Sunday afternoon and was largely attended by friends and business associates.

The Rev. Dr. Clarence Reidenbach officiated and burial was in Forrestdale cemetery.

Frank E. Floyd

Frank E. Floyd, executive secretary of the National Paper Trade Association, died last Thursday, March 26, in the Marott Hotel, Indianapolis, at the age of 58. He was well known to the paper industry throughout the country and his work and services were highly regarded by the merchants and manufacturers in every branch of the entire trade.

Mr. Floyd was prominent for many years in business and fraternal life in Indianapolis. He had been secretary and general manager of the Crescent Paper Company until three years ago, when he resigned and moved to Scarsdale, N. Y., to take up the secretaryship of the national association. He and Mrs. Floyd returned to Indianapolis six weeks ago. He was confined in the

FRANK E. FLOYD

Methodist Hospital until about a week before he died, when he went to the Marott Hotel

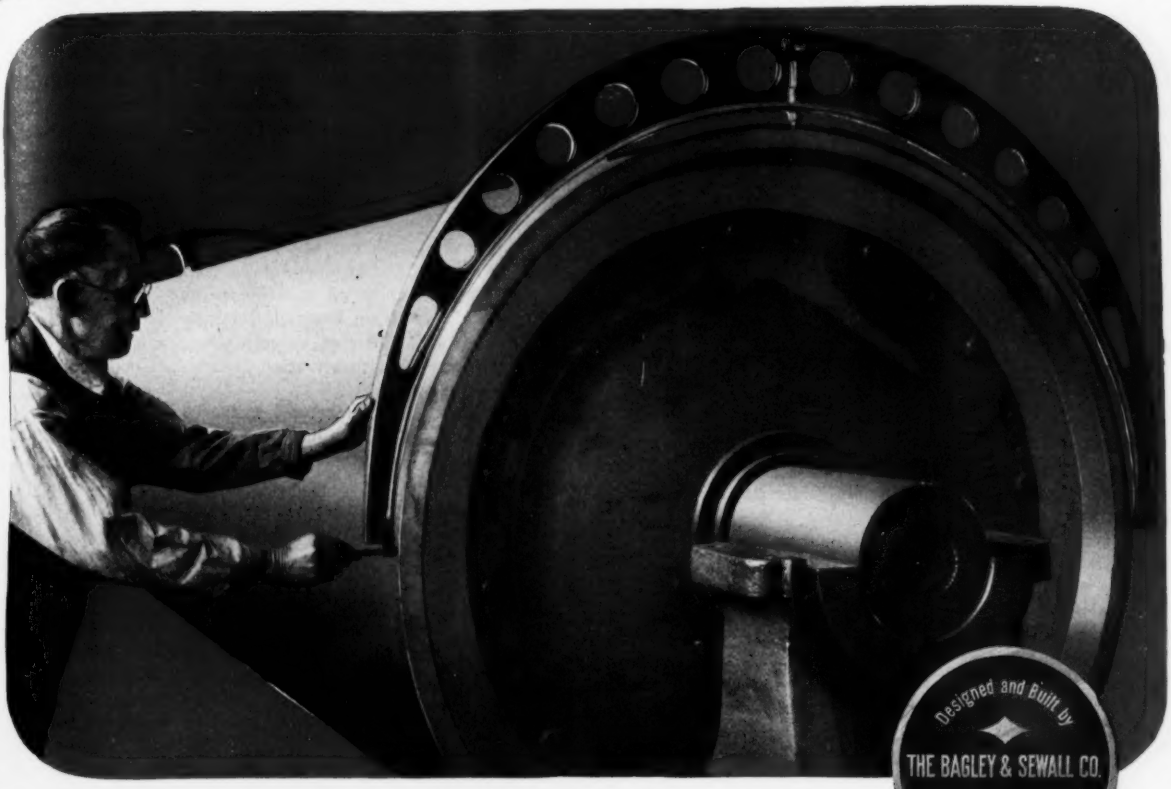
Mr. Floyd was born in Indianapolis, January 25, 1873. He was a paper merchant all his life. He was prominent in Masonic circles, was past master of Oriental Lodge No. 500 F. and A. M., and a member of the New York Temple of the Mystic Shrine and the supreme council of the thirty-third degree. He was a member of the Scottish Rite, taking the degree in 1909, and had served as an officer of the Rite.

Mr. Floyd was prominent in work of the Third Christian Church many years and had much to do with the erection of its present building. He was a past president of the Indianapolis Rotary Club, a member of the Columbus Club and the Meridian Hills Country Club.

Funeral services were conducted by the Rev. William F. Rothenburger, pastor of the Third Christian Church, in the Scottish Rite Cathedral. The Rev. T. W. Grafton, a former pastor of the Church, assisted.

The Scottish Rite ritualistic service followed. The Masonic quartet sang. Burial was in Crown Hill Cemetery.

Survivors are the widow; a son, Frank E. Floyd, Jr., of New York; two daughters, Mrs. Willis Benton Conner and Mrs. Leonard G. Carlin, both of Indianapolis, and three grandchildren.



Production Rolls Smoother On Bagley & Sewall Rolls

A paper machine is basically a collection of rolls with just enough other material to hold them together. That is why Bagley & Sewall,—builder of efficient paper machines,—devotes a large section of its immense plant exclusively to *rolls*,—a specialized department tooled and manned for the production of every type of paper machine roll, without limitation of size or material.

Here are casting pits that, at a single pour, hatch rolls wide enough to fit the widest machines the industry boasts; precision lathes that pare down surfaces to micrometer exactness; special means for machining the *insides* of dryers to an exact thickness that furthers uniform drying, steam economy and smooth running; monster "mikes" that span five feet and gauge split thousandths of an inch; intricate devices that reveal the hidden secrets of balance, static and dynamic.

And here, too, are skilled men with a real affection for their work,—men who find fascination in eternally seeking higher standards. Bagley & Sewall ideals and capabilities in roll production are reflected on your machines in operating economies, low power consumption, longer life for wires and felts, the minimizing of broke, the stepping up of product quality. Production *does* roll smoother on Bagley & Sewall rolls.

The Bagley & Sewall Co.

Watertown, N.Y.

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Southeastern Superintendents to Meet

Plans are progressing rapidly for the meeting at the Jefferson Hotel, Richmond, Va., April 10 and 11 for the meeting of the Southeastern Division of the American Pulp and Paper Mills Superintendents Association. The program is being arranged under the supervision of F. J. Morrison of the Hummel-Ross Fibre Corp., Hopewell, Va., and will be announced as soon as completed. Among the papers to be presented are the following: a paper on Doctors, a paper on Vertical Beaters, a paper on the General Discussion of Shrinkage Loss in Paper Mills. The program will include also a round table discussion on fine papers to be lead by B. K. Steadman of the Standard Paper Manufacturing Company, Richmond, Va., for which the following questionnaire has been issued:

What blue and red will give the brightest whites regardless of fast to light qualities, but not affected by ordinary mill conditions?

What blue and red will give brightest whites with fast to light qualities?

What is best beater and jordan filling material for hard sized paper?

What material will heat the stock the least at same degree of hydration?

What is best all round speed for jordan plugs on general run of commercial fine papers?

What effect, if any, has bleach residue in pulp on fine papers?

What effect has excess bleach in pulp on beater treatment? Jordan treatment? What is best remedy for this condition?

What effect has hypo-sulphite of soda used as bleach neutralizer on stock, on machine clothing?

Does paper, when an anti-chlor is used, retain its original strength, color, sizing, etc., when paper is made with stock free from bleach?

What effect has rosin on mullen and folding qualities of engine sized machine dried paper?

What effect has alum on above, and what advantage has iron-free alum over commercial alum which contains a small amount of iron?

Can folding qualities of a given stock be improved or increased by slice or head manipulation?

What effect on folding quality has water, shake, vacuum boxes and roll presses, drying and calendering?

What moisture content should paper have to get maximum strength and fold, and at the same time lie flat and run satisfactorily on presses or envelope machines?

What effect has weight on opacity? What effect has opacity on color? Is it possible to make as bright a white with high opacity as on a more transparent sheet?

What effect has the ordinary degree of hydration, such as the ordinary sulphite bond or envelope, on opacity? Increasing the opacity of a sheet, to what extent are the strength and folding qualities affected?

What pulps are best adapted to opacity and what effect has sizing and loading on same?

How should stock be handled to get best opacity in beaters, jordans and on machines?

It is the earnest desire of the Division to have as many members and friends present as possible and a cordial invitation is extended also to the wives of friends and members. Those who play golf are urged to bring along their golf clubs as there will be a golf tournament Saturday, probably in the afternoon.

Boston Paper Trade Happenings

[FROM OUR REGULAR CORRESPONDENT]

BOSTON, Mass., March 30, 1931—At the meeting of the New England Paper Merchants Association at the Harvard Club of Boston, Thursday evening, Ralph B. Wilson, vice-president of Babson's Statistical Organization, Wellesley Hills, Mass., gave an interesting talk on general conditions. President Floyd H. Blackman presided. About 25 were present.

Frank A. Juckett, president of the Hurlburt Paper Manufacturing Company, South Lee, Mass., is to discuss new lines of paper, which his company is developing, at a sales meeting at the office of Carter, Rice & Co. Corp., to be held April 4. At a recent sales meeting at the office of the same company, Joseph Moses, sales manager of the Falulah Paper Company, manufacturers of Falpaco Blanks, gave a talk which he illustrated with interesting and attractive specimens. These specimens showed the possibility and suitability of the products of his company for types of work involving process color, offset, half-tone and cut-out displays.

The New York-New England Company, Holyoke, Mass., have been making a card case of Veteran Cover, appearing like leather, which their Boston representative, Henry L. Goodman, is passing out to the trade.

S. W. Bartlett, president and treasurer of the Baird & Bartlett Company, box board merchants, has returned from a four weeks visit at Hot Springs, Arkansas, much improved in health.

Waldo E. Pratt, president of Hollingsworth & Whitney Company, who has been at the Newton Hospital, Newton, Mass., is convalescent at his residence at Wellesley, Mass.

Blair B. Stringfellow, Jr., New England representative of the Albemarle Paper Manufacturing Company, Richmond, Va., has returned from a short visit to the mill.

The March issue of "How," published by Tileston & Hollingsworth Company, and edited by A. V. Howland, is the Calendar number, containing an introductory article, with appreciation of the mechanical part of the work, and the analyses by an expert. There is also an article by an amateur in regard to the pictures of the calendar. Blue Hill Text is discussed. The number is printed on Blue Hill Text, wove, white, with Milton Cover, blue.

Max M. Tushins, formerly manager of the Boston office of the Atlas Publishing Company, Inc., has opened an office at 176 Federal street, handling, among other commodities, cotton rags and waste.

Ely Rosenbloom, Inc., Boston, has been incorporated to deal in paper, twine, bags and boxes. There are 100 common shares without par value. Incorporators are Frances I. Rosenbloom, president; Ely Rosenbloom, 48 Elm Hill avenue, Roxbury, Mass., treasurer, and Moe Rosenbloom.

K. E. Tozier, of the Mozart Paper Company, Holyoke, Mass., called on the trade last week, showing some lines of his company, used in covering boxes. H. W. Tunstan, sales manager of the book and cover paper and box paper departments of the A. M. Collins Manufacturing Company, Philadelphia, manufacturers of box, lining, and other papers, visited the trade last week. Recent visitors were Howard Scholes, of the Taylor Card and Paper Company, and Everett Young, both of Providence, R. I.

J. M. Gamble Returns From Europe

BROWNVILLE, N. Y., March 31, 1931.—J. Munson Gamble, president of the Brownville Board Company, has returned from a tour of Europe during which he visited many of the principal manufacturing centers. He was accompanied by Mrs. Gamble, who has crossed the ocean several times. Much time was spent in Italy, where Mr. Gamble said industrial conditions looked very good. The party visited Venice, Milan, Genoa and Nice.

G. H. Gould Returns from Aerial Tour

LYONS FALLS, N. Y., March 31, 1931.—Gordon H. Gould, who is associated with his father in the Gould Paper Company, returned this week from an extensive flying trip to various cities in the country. The journey was made in a Stinson Junior cabin monoplane recently purchased by Mr. Gould. During the trip many of the principal cities in the South were visited after which the party went through the West. No motor troubles were experienced and weather conditions were excellent during the entire trip.

New York Trade Jottings

Gotham Tissue Corporation, of 312 Locust Avenue, New York, has increased its capital from $81,000 to $156,000.

* * *

Price & Pierce, Ltd., pulp and paper agents, are now installed in their new and up-to-date quarters on the 36th floor of the new Lincoln Building, New York.

* * *

F. J. Sensenbrenner, president of the Kimberly-Clark Corporation, and the Spruce Falls Power and Paper Company, Ltd., was a prominent New York visitor last week.

* * *

Major Oliver M. Porter, manager of the National Kraft Paper Manufacturers' Association, with headquarters at 122 East 42nd street, New York, visited St. Louis, Mo., last week in the interest of his organization.

* * *

Schlosser Paper Corporation, of 75 Varick street, New York, has been appointed co-distributor in New York for Thomas N. Fairbanks Company, for imported hand-made and mould papers from England, Holland, France and Italy.

* * *

Alfred T. Carter, of the Boston, Mass., sales office of the Pejepscot Paper Company, Inc., is now back on the job after an illness of about two months. The general sales office of the company is located at 42 Broadway, New York.

* * *

W. L. Jones, Inc., paper and twine merchants, of 96-98 Prince street, New York, have been successful in securing orders from the United States Government Printing office of 530,000 lbs. of 50 per cent rag manifold paper, which will total approximately $85,000. W. L. Jones, Inc., have also been successful in securing one of the largest orders from the Navy Department for pads. It is for ten cars of pads for one delivery, and will total $30,000.

* * *

"The importance of the package in merchandising," is the subject of the lecture which J. D. Malcolmson, director of the research engineering department of the Robert Gair Company, of 420 Lexington Avenue, New York, will deliver Monday evening, April 6, before the students of the Division of Retailing of New York University. Mr. Malcolmson was for several years engaged in research work in paper board products at the Mellon Institute at Pittsburgh before becoming associated with the Robert Gair Company.

* * *

Directors of Sealcones, Inc., owners of patents for containers for milk and other products, have approved issuance of $500,000 6 per cent three-year debenture notes. In report to stockholders at the annual meeting, Walter H. Birge, president, stated that the packing of orange juice in Tampa, Fla., for the Borden Company, is expected to increase the distribution of containers to over 1,000,000 a week by the beginning of May. At the present time, the Sheffield Company and the Borden Company in New York City use Sealcone containers for milk at the rate of 100,000 a day.

* * *

The regular weekly meeting and luncheon of the Eastern Division of the Salesmen's Association of the Paper Industry was held on Tuesday of this week at George's Restaurant and attracted an overflow attendance. The reports from representatives of various branches of the industry showed a present operating range of from 60 per cent to 75 per cent on different grades, with an advance in price of one quarter of a cent for kraft wrapping. At the conclusion of the luncheon, everyone paid a visit to the Westinghouse Lighting Institute in the Grand Central Palace, where they were entertained with an illustrated talk on the subject of colors and lighting effects, by Al. Paulus, lighting engineer of the Westinghouse Lamp Company, of Bloomfield, N. J.

Better Paper Demand in Indianapolis

[FROM OUR REGULAR CORRESPONDENT]

INDIANAPOLIS, Ind., March 23, 1931.—Some little improvement is seen in the paper business here, particularly in certain lines. The paper manufacturers are producing a little more than was the rule immediately after the first of the year. This is particularly true of the paper box manufacturers who report that some lines of industry using their products seem to be well fixed for orders. Manufacturers of corrugated board also are reporting slightly increased production over last month.

Demand for fine papers is improving slightly. The local trade reports that inquiries from printers are more frequent and they say there is quite a bit of work in prospect for the coming month when the spring season will open in earnest.

Paper stock demand is poor. The local warehouses generally are full to overflowing and buying prices are way down. The local paper stock men are expecting the manufacturers to begin buying a little more heavily before the end of the month, giving them an opportunity to dispose of some of the surplus on hand at least.

Early demand for building papers is none too good. Stocks on hand are very low, however, the dealers having made no effort toward replenishment since inventory, being content to await the opening of spring. Nor are they expected to do much buying, except of the emergency variety until the trend of the building season is more accurately determined.

Glassines and cellophanes are somewhat more active. Tissues also are a little more in demand. It is expected that tissues and such specialties as paper cups and plates will begin to move more rapidly during the next two weeks as the dealers prepare for the beginning of the picnic and vacation season.

I. P. Regular Quarterly Dividends

The board of directors of International Paper and Power Company, at a meeting held March 25, declared the regular quarterly dividend of one and three-quarters per cent on the 7 per cent cumulative preferred stock of the company, and the regular quarterly dividend of one and one-half per cent on the 6 per cent cumulative preferred stock of the company, payable April 15, 1931, to holders of record at the close of business April 4, 1931.

The board of directors of International Paper Company, at a meeting held March 25, declared the regular quarterly dividend of one and three-quarters per cent on the cumulative 7 per cent preferred stock of the company, and the regular quarterly dividend of one and one-half per cent on the cumulative 6 per cent preferred stock of the company, payable April 15, 1931, to holders of record at the close of business April 4, 1931.

Michael Doyle Regaining Health

[FROM OUR REGULAR CORRESPONDENT]

OGDENSBURG, N. Y., March 31, 1931.—The condition of Michael Doyle, president of the International Pulp Company, Gouverneur, is reported showing improvement at the Hepburn Hospital in this city. He recently underwent an operation which is said to have been successful and his many friends look for his early recovery. It is expected that he will be able to return to his home within a few weeks. He is widely known in manufacturing circles and has been prominently identified with numerous projects leading to the development of this section.

Connecticut Valley Cost Men Meet

[FROM OUR REGULAR CORRESPONDENT]

HOLYOKE, Mass., March 31, 1931.—The March meeting of the Connecticut Valley Chapter of the Cost Association of the Paper Industry was held last week at the Hotel Nonotuck. The principal speakers were Nelson Foley of the Scoville Wellington Company of Springfield on "Mill Expense" and Thomas J. Burke, director of the Cost Department of the American Pulp and Paper Association of New York City.

POWER PLANT SECTION

REDUCING POWER COSTS THROUGH UNIT TREATMENT

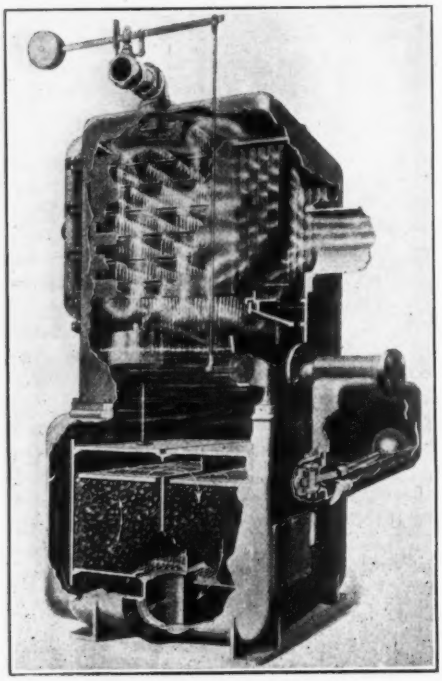
Conducted by **Reginald Trautschold Consulting Engineer**

Systems of Feed Water Heating

Effect Attractive Savings

It is held by some authorities that the closed type of feed water heater should be used exclusively in the paper mill power plant, since with a closed system there is no danger of oils and other impurities entering the feed water with subsequent damage to the boilers. Others advocate the use of open type, feed water heaters, particularly in conjunction with other heaters of the closed type, while others favor dependence upon so-called high pressure evaporators. Furthermore, satisfactory results are being secured in individual plants with any one of these systems, a saving of about 1 per cent, in fuel consumption being effected for each 10 to 12 degrees Fahrenheit that the water is raised in temperature and the preheating of the boiler feed reducing the temperature strains in the boiler.

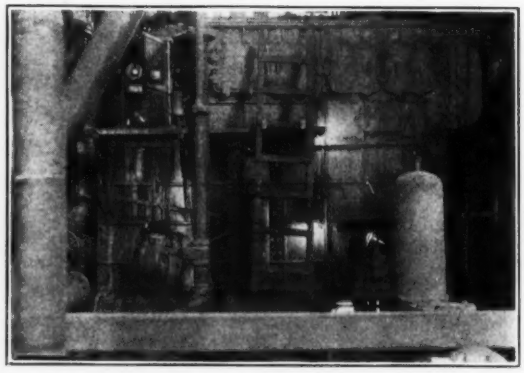
The simplest method of bringing the feed water supply to a temperature close to that of the water in the boiler is, nevertheless,



Courtesy: Worthington Pump & Machinery Corp.

FIG. 1.

Sectional view showing constructional details of modern open type feed water heater



Courtesy: Cochrane Corp.

FIG. 2.

Metering heater (combined open type, feed water heater and V-notch meter) at the Haverhill Box Board Co.

to heat it by direct contact with steam and it will be well, consequently, to describe briefly the open type of water heater and to point out its advantages and limitations before discussing the closed systems of feed water heating which appear to be favored at the present time for the modern boiler plant. It might also be well to stress here the fact that the satisfactory feed water heating system has two important functions to discharge, the heating of the water to the highest attainable temperature and to purify the feed supply by filtration or otherwise.

Open Heaters

The open type of feed water heater has the distinctive advantage of making effective use of all the excess heat in the steam used to elevate the temperature of the feed water and if the steam supply is adequate can heat the water to within a couple of degrees of the exhaust steam temperature. In fact, such condition should pertain in order to capitalize in full upon the efficiency of the heater, necessitating the bleeding of steam from some stage of the power turbine for feed water heating if there is any deficiency in the usable supply of exhaust steam. This is the situation which is very apt to be encountered in pulp and paper mill service, for much of the steam used in process operations, for direct cooking, agitating, etc., cannot be returned to the boiler system.

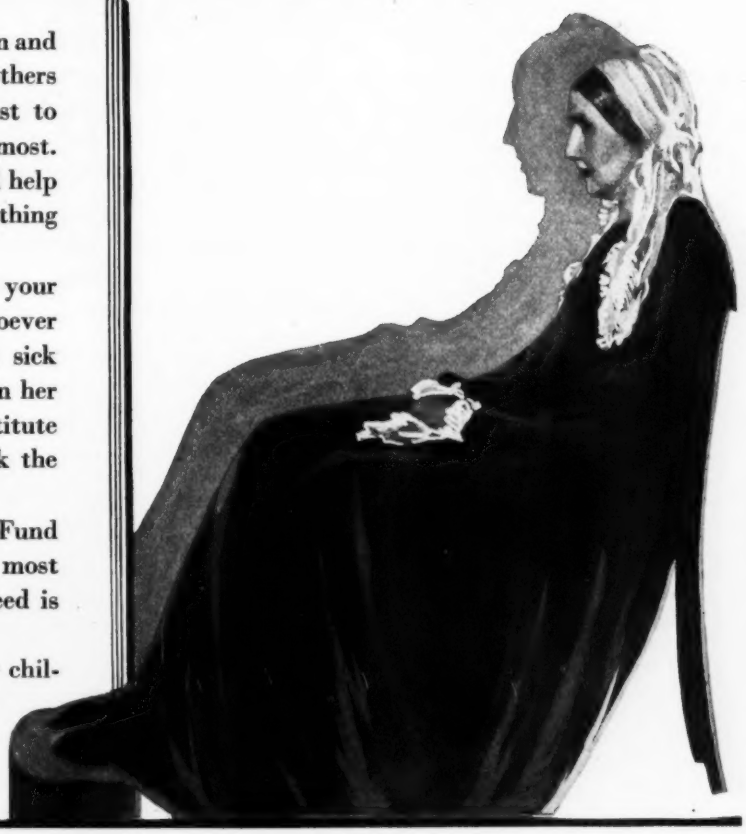
In the usual types of open feed water heaters, the feed water supply enters at the top and the water drops over a series of trays, arranged in such manner that the water is broken up into finely divided streams before it reaches the reservoir at the bot-

IN times of financial depression and unemployment, widowed mothers and orphaned children are first to suffer—and silently, they suffer most. Thousands of them today need help—money help—for food and clothing and creature comforts.

It is for them that we ask your help this Mothers' Day. Whatsoever your mother would do for a sick neighbor or hungry child, do in her name for unemployed and destitute mothers and children who lack the comforts and necessities of life.

The Golden Rule Mothers' Fund will be distributed through the most efficient agencies where the need is most acute.

Give for mothers—for their children—the gift that will make them happiest.



A "GOLDEN RULE" MOTHERS' DAY

National Committee, Golden Rule Mothers' Fund

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MRS. JOHN H. FINLEY.....*Chairman*
MRS. EDGERTON PARSONS.....*Secretary*

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Mrs. M. C. Migel	Mrs. J. P. Weyerhaeuser
Mr. William B. Millar	Gov. George White
Mrs. William H. Moore	Hon. Ray Lyman Wilbur
Major General John F. O'Ryan	Miss Mary E. Woolley

IN HONOR OF MOTHER—HELP OTHER MOTHERS

To The Golden Rule Mothers' Fund Committee
Lincoln Building, 60 East 42nd Street
New York, N. Y.

I hereby subscribe.....Dollars to the GOLDEN RULE MOTHERS' FUND, to be applied by the Committee where most needed, unless specifically designated below.

Signed.....

Address.....

This gift is to be recorded in the name of.....

and used for.....

MAKE CHECKS PAYABLE TO THE GOLDEN RULE FOUNDATION MARKED FOR "GOLDEN RULE MOTHERS' FUND"

THIS SPACE CONTRIBUTED

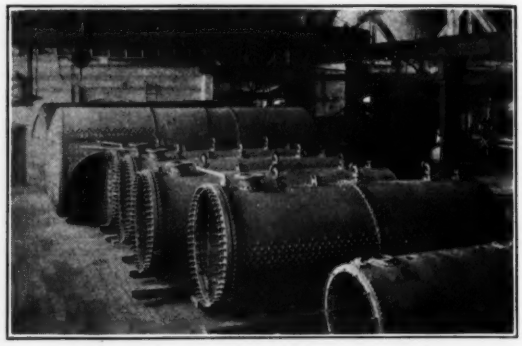
tom of the heater. The heating steam, exhaust from power units and the make-up steam bled from stages of a power turbine, comes in direct contact with the water spray, releases its latent heat and condenses. In this manner, the primary function of the heater, that of elevating the temperature of the feed water supply, is efficiently discharged, but when it comes to the second requisite, the purification of the mixture of condensate and raw feed water, complications arise and limitations to the use of open type heaters are encountered. The apparatus is called upon to serve as an efficient purifier as well as a highly effective heater.

While a moderate amount of scale material in the feed water may not exert any particularly harmful influence on the efficiency and capacity of the boilers of low or moderate pressure, operating at or below their normal ratings, it is very important that no scale or scale forming substances be allowed to accumulate in boilers driven at high ratings or operated at high pressures. Pure water for feed purposes is absolutely essential, if economy and continuity of operation are to be secured under these conditions. The suitable open type water heater for use in the modern paper mill, consequently, should remove all the suspended matter in the raw water or condensate, dispose of all vegetable and organic impurities which may float on the surface of the water in the heater, precipitate the ingredients responsible for so-called temporary water hardness, the carbonates of lime, magnesia and iron, and deaerate the feed water.

If the water supply is of permanent hardness, *i. e.,* if it contains sulphates, chlorides and nitrates of lime, magnesia and iron which are not completely precipitated at the boiling temperature of water, the water supply requires special treatment for purification. This chmical preparation of the make-up water, however, is essential whatever system of feed water heating is employed and is not to be looked upon as a burden imposed only when open type heaters are used. Nevertheless, it is well to draw attention to the fact that even the most effective of modern, open type, feed water heaters cannot be depended upon to remove permanent water hardness satisfactorily.

Feed Water Purification

The removal of the suspended matter from the heated water, on the other hand, can be successfully consummated by careful filtration, since this sludge consists chiefly of clay, silica, iron, alumina and other inorganic matter in the form of mud and silt. The vegetable and organic impurities which float on the surface of the water in the heater, though very apt to cause serious boiler foaming if allowed to enter the steam generator, can be carefully skimmed from the surface of the water in the heater, while the precipitation of the soluble compounds causing temporary water



Courtesy: The Hoppes Mfg. Co.

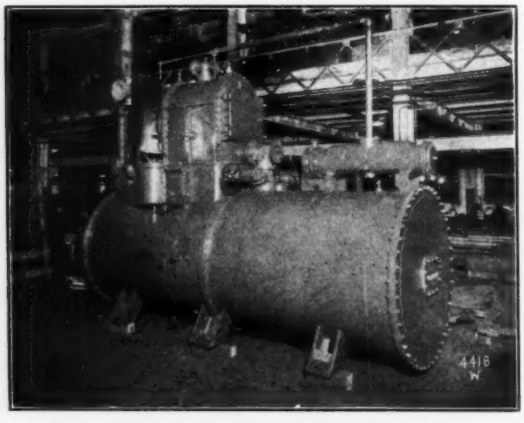
FIG. 5.

Modern, straight tube, closed type, feed water heater

hardness is readily accomplished. These compounds consist for the most part of carbonates of lime, iron and alumina, all of which become insoluble and precipitate as the water approaches its boiling temperature. It is only the sulphates, chlorides and nitrates which require preliminary chemical treatment to effect their precipitation.

The ridding of the feed water supply of entrapped air and carbonic acid gas is also very necessary, for if the separation of these gases takes place in the boiler they will combine chemically with the steel of the boiler shell and tubes, causing rapid corrosion and the pitting of feed water piping, boiler drums and tubes. These gases are pretty well driven out of the feed water supply at a temperature of about 210 degrees Fahrenheit, however, and this liberation should and can take place in the heater, necessitating only an adequate elevation of the temperature of the water in the heater and provisions for the ejection of the gases. In fact, the deaerating characteristics of the open type feed water heater is one of its most valuable properties.

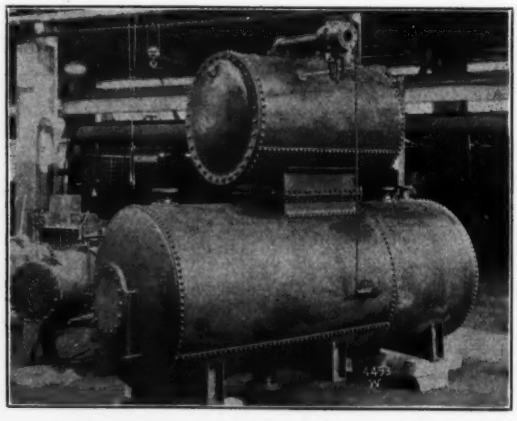
The complete removal of lubricating oils entrained in the exhaust steam heating supply, on the other hand, is, perhaps, the most difficult of the essential tasks in satisfactory feed water heating with open type heaters. An efficient oil separator installed within the heater proper is necessary, but this will only remove the liquid oil. If oils are present which vaporize at the temperature of the hot feed water, they will pass through the separator and form an emulsion with the feed water and the removal of the emulsified oil has then to be consummated by the filter provided for the removal of the suspended matter in the feed water.



Courtesy: Worthington Pump & Machinery Corp.

FIG. 3

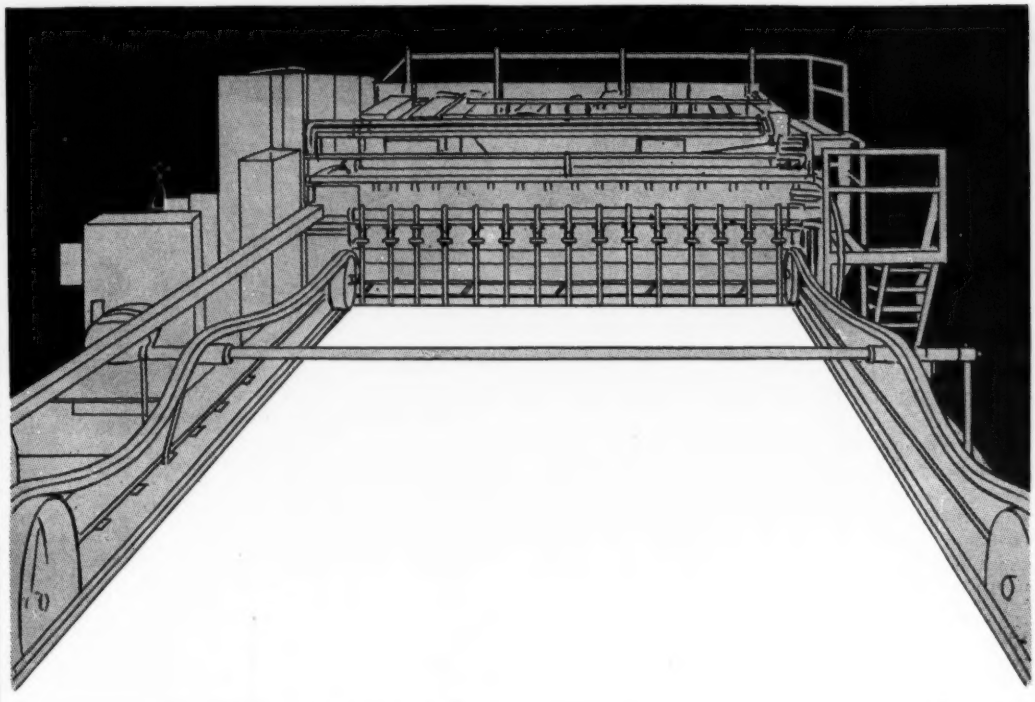
3,000-h.p. open type, deaerating metering storage heater with 150,000-lb. V-notch meter and 34,000-lb. cast iron storage tank.



Courtesy: Worthington Pump & Machinery Corp.

FIG. 4.

150,000-lb. steel shell, open type, feed water heater with extra large storage tank



You Can't Increase Prices
But You CAN Decrease Costs

If bed-rock costs were ever needed in the paper industry—they are needed *now*.

The same is true of quality, Because—it is the better sheet at a favorable price that is finding the biggest and most profitable markets.

Quality and costs are being watched now as they never were before. And, for this reason, the Voith Inlet is playing an increasingly prominent part in producing finer quality papers at lower cost per ton.

Check your Inlets! Get comparative facts! Determine whether your present installations are really giving you the high quality and economical production that you should be receiving. Write the Valley Iron Works Company, Appleton, Wisconsin.

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VALLEY

Equipment for Paper and Pulp Mills

Plant: Appleton, Wisconsin

New York Office: 350 Madison Ave.
Canadian Representatives: Pulp & Paper Mill Accessories, Ltd., Montreal, Canada

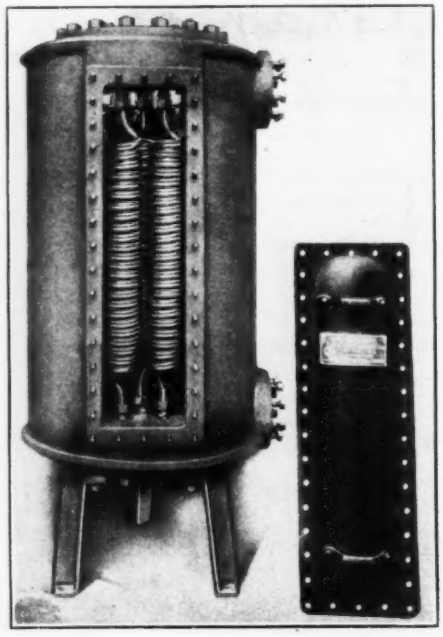
Closed Heaters

In the closed type of feed water heater, the heating steam enters a chamber enclosing banks of brass or alloy tubes through which the water to be heated circulates. The steam gives up its excess heat to the water in the tubes and is condensed, as in an ordinary surface condenser. Increase in the velocity of the water passing through the tubes increases the rate of heat transmission and, obviously, the length of the tubes is a factor in governing the rise in water temperature, since the longer the passage of the water takes the greater is the elevation in water temperature. Various arrangements of these water tubes are employed in different types of closed heaters; banks of straight smooth tubes and corrugated tubes; all of which aim to raise the efficiency of the apparatus. The relative merits of these different constructions need not be enlarged upon, however, though it might be well to state that, as a rule, a closed heater with numerous tubes of small diameter is more efficient than one having a smaller number of tubes of larger diameter.

The use of these closed heaters has grown greatly in recent years, being quite generally employed now as extraction, or bleeder, heaters in the regenerative heating of boiler feed water and as vent heaters in combination with open and deaerating heaters. In the regenerative heating of boiler feed water, the heating steam is extracted from successive stages of steam turbine units and these conditions are particularly favorable to the use of closed heaters, the water supply usually being limited to condensate containing little or no scale forming impurities, free from oil, etc., and the heating steam supply extracted from the turbine stages containing no oil or grease.

Hot Water Storage

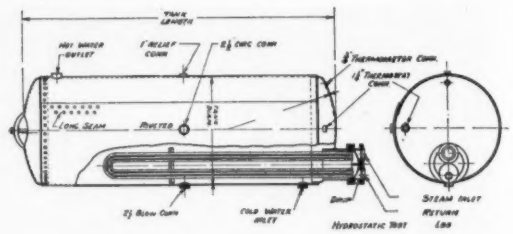
With either open or closed types of feed water heaters, adequate hot water storage can very profitably be provided, either in the heater proper or elsewhere, to furnish a reservoir for condensate returned from heating systems, evaporators, traps, process lines, etc., to maintain a valuable supply of hot water. In the case of open feed water heaters, the storage space can be provided in the section below the heating section, but frequently, and customarily in the case of closed heaters, the installation of a supplementary storage tank, situated either above or below the heater, proves more economical. The arrangement is a cheaper one to install, as a rule, and more latitude is provided in the matter of tank capacity and space requirements.



Courtesy: The Griscom-Russell Co.

FIG. 6.

Modern, multi-coil, closed type, feed water heater



Courtesy: Davis Engineering Corp.

FIG. 7.

Modern storage water heater of the closed (immersion) type

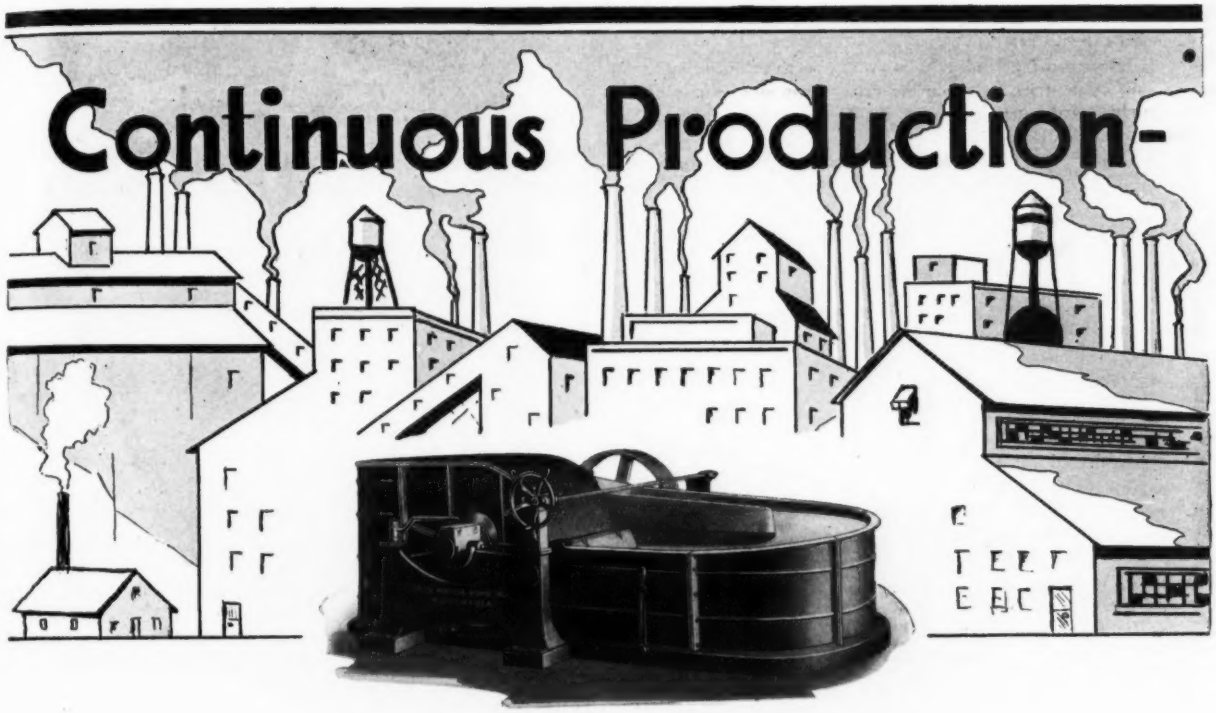
Where the hot water returns are quite intermittent, the overhead tank arrangement is generally used, the flow of storage water to the heater being by gravity and readily controlled by suitable float valves. On the other hand, where much hot water is required at relatively frequent intervals, the arrangement with the storage tank below the level of the heater possesses certain advantages. If the circulation through the heater and storage tank is not sufficiently rapid to keep up the temperature and considerable heat loss occurs through radiation from the storage tank, the storage tank section can be cut out temporarily, or as advisable.

A system of hot water storage of this character is particularly desirable for pulp and paper mills, for not only is a good deal of heat apt to be conserved which would otherwise be wasted in all probabilities, but a plentiful supply of hot water can be made available, not only for boiler feed purposes, but for process requirements. The addition of a supplementary steam reheater in the storage tank will often further increase the value of a considerable water storage for pulp washing and beater engine operation. Inasmuch as the use of hot water in such services is generally irregular and intermittent, as is also the return of condensate from paper machines, etc., the tank storage serves as an effective "steam accumulator." The aid and gases entrapped in the feed water are pretty well driven out of solution, furthermore, so that the corrosion of piping, other apparatus and rusty water troubles are in large part avoided.

High Pressure Evaporators

A development of marked value for service in modern boiler plants operating high pressure, high temperature steam generators, the high pressure evaporator, has proved eminently adaptable to the needs of pulp and paper mills, as is well evidenced by the results secured with such units at the high pressure steam plant of the Paul A. Sorg Paper Company at Middletown, O. So very satisfactory has been the use of these high pressure evaporators in respect to the feed water heating problem in modern paper mills, in fact, that a brief exposition of how these units function in a plant operated on high pressure steam should be of quite general interest.

The main steam supply of the plant is generated at high pressure and carries a large amount of superheat, furnishing an excellent power medium on which to operate high pressure steam turbines economically and at high efficiency. This main steam supply is, however, under too much pressure and much too hot for use in the mill's process work, while the exhaust from the admirably served power units could not be economically used for process operations, since much of it could not be returned to the boiler system for feed after being employed for direct cooking, stock agitation, etc. The loss of much of the process steam, so far as the boiler system is concerned, would necessitate a large volume of suitable make-up water being provided for the high



Uninterrupted Production— Means Profits!

In these days when everyone has difficulty in keeping the "wheels turning"—when whole industries are stagnant—it is in these days that the wise man checks up to make sure that everything is in A-1 shape for uninterrupted production in the better days sure to come.

Buyers want better paper too, and you must meet the demand or lose business.

Don't wait until you are being crowded for shipments and trying to rush production; now is the time to check your Beater Room needs.

Dilts New Type Beaters will enable you to make better paper and enjoy uninterrupted production. They will save time, labor, power and expenditures for repairs—and earn real profits for you too.

Check up now. Let our engineers help you. Consult with them—now is the time. They are at your service. No obligation incurred.

—Dilts—

MACHINE WORKS Inc. FULTON, N.Y.

"Your Paper is made in your Beaters"

pressure boilers, entailing the heating and thorough treatment of much raw water.

This burden and difficulty is avoided with the use of high pressure evaporators, by using the main steam supply as the heating medium and a supplementary supply of raw water from which to generate the steam employed for all the mill's process operations. The condensate from the evaporator generating the process steam from the main steam supply, with practically no sacrifice of heat, is returned to the boilers, also without much waste of heat, and keeps the main steam generators replenished with pure water in a highly efficient closed boiler system, requiring very little make-up. In this way, the need and expense of excessive boiler feed make-up water suitable for use in modern high pressure steam generators is avoided and all the economies of high pressure steam power generation capitalized upon to the fullest extent.

Feed Water Heating Profitable

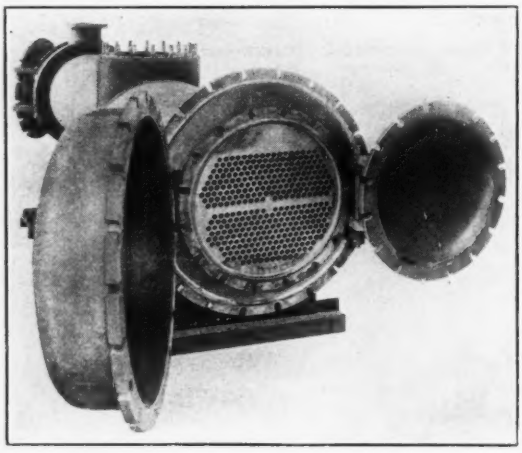
While it is hardly necessary to enlarge further upon the advantages of employing high pressure evaporators in the modern high pressure steam plants serving pulp and paper mills, some conception of the intrinsic value of feed water heating with modern feed water heaters in what may be termed still typical plants, in order to differentiate them from the more advanced power plants which have been built by progressive pulp and paper mills during the past few years, can readily be formed from the results secured nowadays. For example, from attainments in a plant where about 20,000 pounds of boiler feed water are heated per hour from 100 to 217 degrees with exhaust steam at 5-pound pressure.

Saving of 750 Tons of Coal Annually

Assuming the burning of fuel having a heating value of 14,000 Btu. per pound and 24-hour operation for 300 days per year, the heating of such volume of feed water by exhaust steam through a range of 117 degrees, in a modern multi-coil closed feed water heater, would represent a saving of approximately 750 tons of coal a year. Placing a value of $4.00 a ton on the coal, the results attained in feed water heating effect an annual saving of $3,000.00. A recent quotation from a manufacturer of closed feed water heaters of the multi-coil type for a heater of adequate capacity to make such showing is less than $1,500.00 for the heater installed and ready for service.

Better Returns Frequently Realized

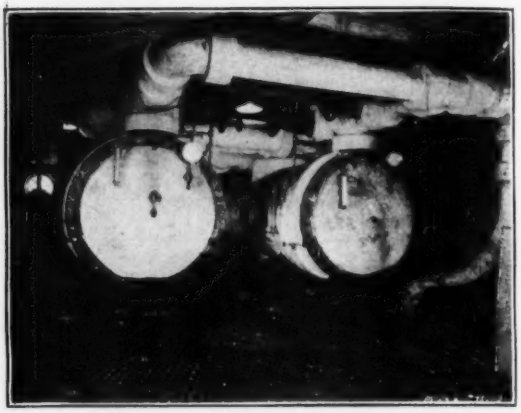
Better returns than this are frequently realized, particularly in plants serving pulp and paper mills, owing to the customary high load factor and the fact that the paper machines with their heavy demand for low pressure steam operate virtually continuously. In one New England mill where coiled tube, closed type, water heaters are used in conjunction with open type heaters for handling 75,000 pounds of boiler feed water an hour, the entire investment in feed water heater equipment was liquidated from the net savings effected in substantially a single month. In another plant, the investment was retired in a little over four months. These results are dependent to some extent, of course, upon the methods employed in feed water regulation, which will be the topic taken up in the next discussion.



Courtesy: Ross Heater & Mfg. Co., Inc.

FIG. 8.

Straight tube, closed heater used for heating white water at the Consolidated Paper Co. mill at Monroe, Mich.



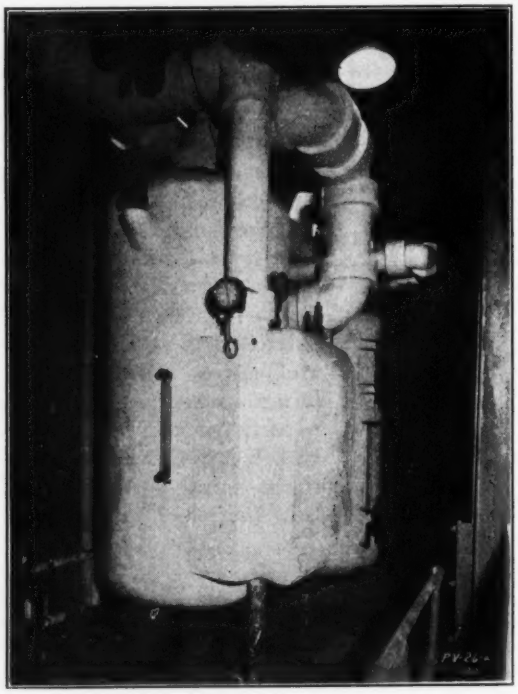
Courtesy: Foster Wheeler Corp.

FIG. 9.

High pressure evaporators operating in series at the Paul A. Sorg Paper Company plant, Middletown, O.—17,000 lbs. of water evaporated per hour

Regulator Equipment

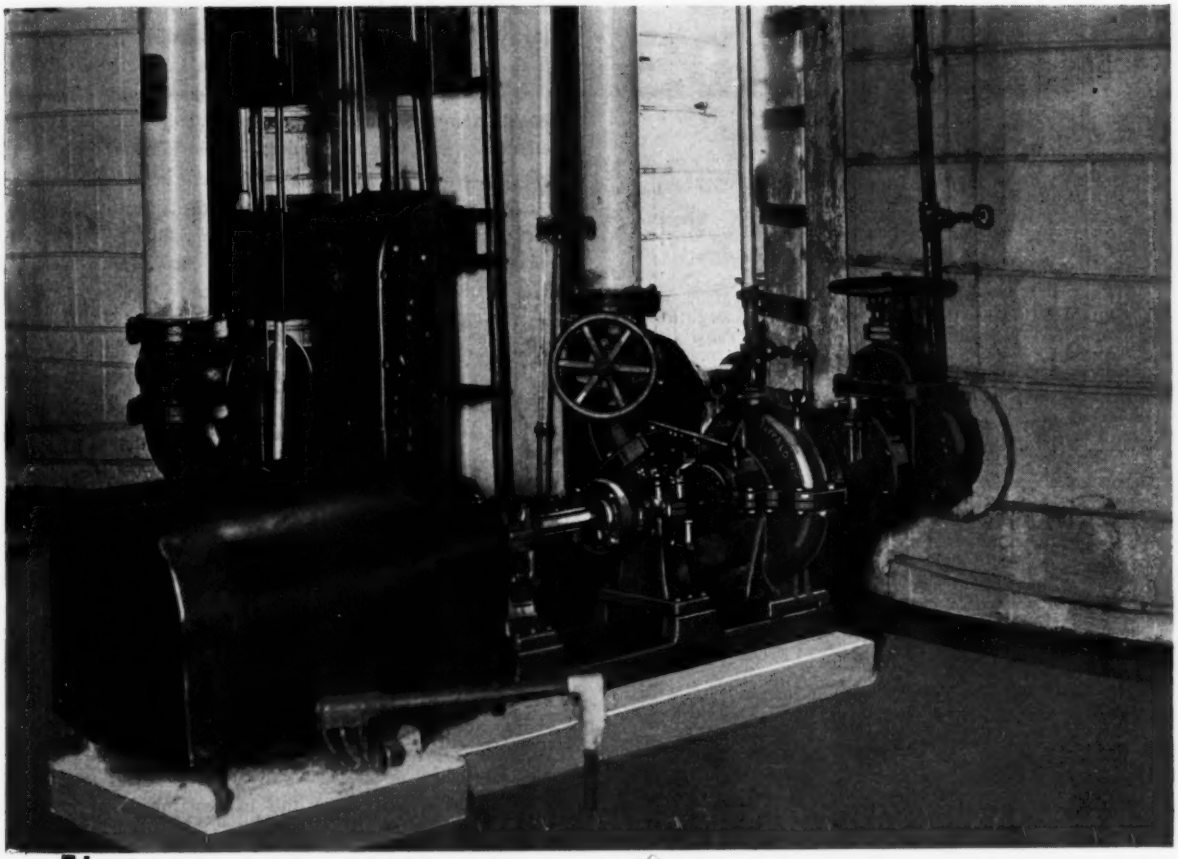
Equipment for the regulation of stock consistency is described in a 4-page bulletin issued by the Valley Iron Works Company, Appleton, Wis., which will be sent free on request to the company.



Courtesy: Foster Wheeler Corp.

FIG. 10.

High pressure, submerged type, evaporator installed at the New Haven Pulp & Board Co. plant



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High consistency stocks handled easily—

Just a few years ago, 4% stock was heavy enough. Today in mills where Buffalo pumps are used, paper stock up to 8% is not uncommon.

In many cases, the first Buffalo non-clogging stock pump installed in a mill has shown such remarkable results that future orders have been placed with us without question.

Branch engineering offices in all principal cities are at your disposal. Write for detailed information.

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PAPER TRADE JOURNAL

ESTABLISHED 1872

Published at 34 North Crystal St., East Stroudsburg, Pa. Executive and Editorial Offices, 10 East 39th St., New York, N. Y.

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Price, Per Copy, 10 Cents United States, Per Annum, $4.00
Canada and Foreign Countries in Postal Union, $6.00

Member Audit Bureau of Circulations

Vol. XCII New York, April 2, 1931 No. 14

NOT UNFAIR COMPETITION

Dr. James E. Campbell, president and treasurer of the Dexter Sulphite Pulp and Paper Company, Dexter, N. Y., has sent the PAPER TRADE JOURNAL a copy of a rather disturbing letter which his firm received recently from the Federal Trade Commission. This letter is reprinted herewith.

"As the result of an investigation made by the Federal Trade Commission, it appears that your company has advertised, referred to, designated and described its 'Ajax' brand of paper as 'Parchment' when in truth and in fact the product so advertised, referred to, designated and described was not made of the skin of a lamb, sheep, kid, goat, calf or other animal.

"It seems that the methods used by you fall within the definition of the term 'Unfair methods of competition in commerce,' the use of which the Commission is required to prevent.

"This letter is written to advise that if you conclude to change your methods in this regard and will voluntarily cease and desist from the described acts, the Federal Trade Commission will accept your stipulation to that effect as dispositive of the issue provided you will promptly file with the Commission a complete and detailed statement, setting forth the facts of your methods, a declaration that you will cease and desist forever therefrom in interstate commerce, and agreement that if at any time you resume the methods in question, this statement may be used in evidence against you in the trial of the complaint which the Commission may issue. A form in duplicate, embodying the above requirements, is enclosed herewith for your consideration by the Commission. If it is approved by the Commission, one copy will be retained and the other returned to you after proper execution.

"It must be understood that it is your right to have a formal complaint issue tried in the manner provided by the statute and practices of the Commission, and if for any reason the disposition of this matter by voluntary cessation is not acceptable to you, your right of defense will be assured by the statutory procedure."

By common usage, the word parchment was long since taken over into the nomenclature of the paper industry and made to designate in unmistakable terms a certain variety of paper. The word parchment was first used in the Classified Section of Lockwood's Directory of the Paper and Allied Trades in 1896. This means that the term parchment by indisputable evidence has been used in a thoroughly reputable manner for thirty-five years, at least, in the sense to which the Federal Trade Commission now takes exception.

Judging from this fact and general trade customs, the PAPER TRADE JOURNAL is certain that the Dexter Sulphite Pulp and Paper Company is not employing the term to deceive and that the employment of the term in this manner does not, in fact, tend to deceive or is likely to mislead any person of ordinary intelligence.

It is believed that this action of the Federal Trade Commission in the case of the Dexter Sulphite Pulp and Paper Company will strike thinking men in the paper industry as dangerous, to say the least. If the Commission can establish its position in this instance, it is entirely likely that it will lead to additional and perhaps more radical rulings with respect to paper nomenclature in the future. Obviously, such arbitrary rulings may lead to considerable monetary losses where vast sums of money have been spent to establish a brand or a watermark used in connection with such a word and it certainly will tend to bring about a great deal of confusion and inconvenience if the reputable customs of long years standing are summarily overturned or interfered with.

The PAPER TRADE JOURNAL has the greatest respect for the Federal Trade Commission. It has done much commendable work, even in the paper industry, in exercising its legitimate function in correcting unfair practices and trade abuses. But no evil intent certainly can be charged in this particular case. On the other hand, this case does square so completely with like instances of words that have been taken over as paper terms for many years in the past that it is to be hoped that the Commission will exercise its function carefully and intelligently in the endeavor not to impose any unnecessary hardships on one of the great basic industries of the country.

The PAPER TRADE JOURNAL urges members of the paper industry to write the Federal Trade Commission at Washington, stating that the term parchment has been long established in the nomenclature of the industry and that any serious efforts to disassociate its employment in the paper field in the future, as it is used at the present time, would establish a precedent that would almost certainly result in unfair injury to the paper business in general.

ALASKAN WOODS

With large areas in Alaska suitable mainly for timber production, a present utilization of but a fraction of the actual and potential annual forest growth, a variety of species with a large range in properties, and an abundance of water power and timber resources favorable to pulpwood development, increasing economic forest development is presaged for the Territory, according to the Forest Service, U. S. Department of Agriculture.

In order to make available to the public and to industries interested in the use of wood materials knowledge of the true extent and the useful properties of Alaskan woods, L. J. Markwardt, senior forest engineer of the Forest Products Laboratory maintained by the Forest Service at Madison, Wis., has reported in Technical Bulletin 226-T, issued by the U. S. Department of Agriculture, the results of tests of Alaskan woods. These tests

showed that the western hemlock, Sitka spruce, and several other Alaskan woods are equal in strength and other mechanical properties to the same species in the Northwest States.

Forests of Alaska cover approximately 71,347,000 acres, an area as large as the States of Missouri, Maine, and New Jersey combined. The bulk of the commercial timber is located within the Tongass and Chugach National Forests in the coastal region, which are estimated to contain 84,760,000,000 board feet of saw timber. Under Forest Service management, this timber will be handled as a continuing resource, cutting being regulated to assume a permanent supply. In addition to the coast forests, there are some 50,000,000 acres of interior woodland type forests of great potential value to local industry, agriculture, and mining, although not classed as important commercial forests.

Many Import Paper Cases Up For Action

A new record for cases involving paper was established in the United States Customs Court in its session March 9, when eighty-five importations came up for action. None of the cases was tried, but all were postponed for later hearing. This follows closely on the session in October when the Court forced importers to try or abandon a large number of cases, at which time nearly 900 cases were abandoned.

Many of the importations according to the Import Committee of the American Paper Industry were under the tariff act of 1922, and the court has taken steps to have them placed on the docket for early trial.

A case has been tried before the United States Customs Court involving the duty on waxed paper printed for use as candy wrappers. The customs officials held the paper to be dutiable at 5 cents per pound and 20 percent, but the importers claim that the printing is merely incidental, and that it should be dutiable at 3 cents per pound and 15 percent as plain waxed paper. This case was initiated in 1926, but the action taken by the Import Committee at that time caused a great reduction of all further importations of this and similar printed waxed papers.

The Basic Ream—20 Inches x 26 Inches

Leonard I. Houghton, secretary of the Glazed and Fancy Paper Manufacturers Association, 146 Chestnut street, Springfield, Mass., has sent out the following announcement:—

There has been some confusion in the craft about the size of the basic ream which was adopted at the joint meeting of the Conference Committees of the paper box manufacturers association and this association. The size decided upon was 20 x 26 inches, 500 sheets per ream. In connection with this it was voted that our paper be billed in reams 20 inches by the width of the roll and that the bill also show the 20 x 26 inches price and its conversion to the billed price if the paper was in a different width from 26 inches.

The main reason for the adoption of this size is of course the fact that 26 inch rolls are more common than any other width. Most of the glazed and fancy paper manufacturers are now using and have been using for the past few years 20 x 26 inches as their basic size for price lists and quotations. It is hoped that manufacturers, distributors, and the box manufacturers will all cooperate in this in order to avoid confusion and simplify one more thing in the business of those concerned.

Make Box from Flax Waste Byproducts

[FROM OUR REGULAR CORRESPONDENT]

PORTLAND, Ore., March 27, 1931.—The Western Board Products Company, Portland, is introducing a fiber board box made of flax waste byproduct, exceedingly tough. This will stand up when made into shipping containers and is being designed in collapsible form.

Snow-White To Reclaim Paper

The Snow-white Company, Inc. has just been organized for the purpose of reclaiming waste paper by the new Snow-white Process. The present offices of the company are at Oswego, N. Y. and the company has an option on a large group of factory buildings located on the Barge Canal so it will be possible to bring the raw material in by water during the open navigation season,. and also to ship the finished product the same way thus affording a vast saving in freight charges.

W. J. Russell a new man in the paper field is the president. Associated with him is William J. Dial of Dayton, Ohio who has had 28 years experience in the manufacture of paper and reclaimed pulp, having for 8 years been with Crocker, Burbank & Co., at Fitchburg, Mass. for several years with the Champion Coated Paper Company, of Hamilton, Ohio and more recently with the Oxford Miami Paper Co, at West Carrollton.

John A. Wiener one of the best known construction and paper mill men in the United States will act as consultant in lay out and construction and Graham Prather of Oswego will be the Engineer in active charge.

Prof. C. E. Libby of Syracuse has already made numerous tests and studies in connection with the process and the cost of reclaiming by present day methods, and it is expected he will continue his connections.

Mr. Russell has submitted reports and samples of reclaimed pulp made into hand sheets, which show that sheets made from ordinary news papers is actually 52 per cent stronger by the Mullen test and 37½ per cent stronger on the tear test than the original stock from which it was made.

Prof. Libby in reporting on tests made in his laboratory says "In the last test I made for you, *Literary Digest* and *Saturday Evening Post* was reclaimed by your Snow-white Process and the reclaimed pulp made into hand sheets, air dried and tested on the Mullen tester. The results of these tests showed that the de-inked stock was nearly twice as strong as the original paper. This is a very unusual result, for in nearly all of the well-known processes, the treatment results in a very considerable loss of fiber strength."

The initial layout calls for a plant capable of turning out from 30 to 50 tons of pulp a day and which by the addition of machines can be increased to 100 tons, in 24 hours.

As soon as the equipment is placed commercial samples will first be gotten out and the production increased to take care of the orders. At first the stock will be shipped about 50 per cent dry as the reduced cost of re-pulping it will offset the additional freight. While most paper mill men admit that a better paper can be made by the use of some reclaimed pulp, the Snow-white Company, Inc. will, it is believed, be one of the first to produce reclaimed market pulp.

Knowlton Estate Valued at $100,000

WATERTOWN, N. Y., March 30, 1931.—The late George W. Knowlton, president of Knowlton Brothers until his death recently, left an estate valued at more than $100,000, according to the probated will just filed with Judge Fred A. Grant, surrogate. Under the terms his widow is given a life use of the property and after her death the estate is to be equally divided among the remaining five children. The petition for probating the will estimates the personal property in excess of $75,000 and the real property in excess of $25,000. The will was executed in 1918. Under its terms the widow and sons, George S. and Theodore E. Knowlton are named executors.

A clause in the terms of the will directs that the estate remaining is to be divided equally amongst the several children upon the death of Mrs. Knowlton. The executors are also given authority to sell, mortgage, lease, contract and dispose of real property at such times and manner as may seem proper and to invest and reinvest personal property as they deem advisable. They are not to be held responsible for losses incurred through such investments except in case of gross negligence.

HIGH SPOTS IN CHEMICAL HISTORY

No. 2 of a series of advertisements tracing the development and uses of modern chemicals

In 1884, Hilaire de Chardonnet, a French nobleman, patented a process for manufacturing artificial silk, which consisted in forcing nitrocellulose through fine capillary openings.

CELLULOSE

SINCE the days of the early Chinese and Egyptians, the non-nitrogenous skeleton of plants—generally known nowadays as cellulose—has been employed in making many of mankind's most useful commodities.

To the modern, resourceful chemical engineer has fallen the task of taking vegetable fibre and magically transforming it into products of usefulness and beauty... articles which greatly affect habits of living and introduce important innovations throughout industry.

The Paris exposition of 1889 saw the first gown designed entirely from man-made silks. The gossamer fabric startled the skeptical world and marked the birth of rayon, which, as the world now knows, is woven from chemically treated cellulose.

Today, cellulose is the basic ingredient of paper, photographic film, explosives, paints, lacquers, textiles, celluloid products, toilet articles, radio parts, airplane dope, synthetic leather, synthetic wood, hats, rope, twine, wrapping material, wallboard and countless other products ...all of which form a remarkable testimonial to the ingenuity of the modern chemical industry.

It is hazardous to predict what the future holds in store for commodities made from chemically processed cellulose. Even if chemical science contributed no future cellulose products, the thousands of articles now made from this essential basic material would rank high in the history of chemical achievement.

• • •

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Section of the
Technical Association of the Pulp and Paper Industry
Edited by Ronald G. Macdonald, Secretary

Current Paper Trade Literature

Abstracts of Articles and Notes of Papermaking Inventions Compiled by the Committee on Abstracts and Bibliography of the Technical Association of the Pulp and Paper Industry

Clarence J. West, Chairman

For photostatic copies of articles appearing in the Abstract Section, address the chairman of the Abstracts Committee, Dr. Clarence J. West, National Research Council, 21st and B. Streets, Washington, D. C. The charge for this service is: Photostats 9 x 11 inches, 18 cents each; 18 x 11 inches, 35 cents each; 22 x 18 inches, 70 cents each; minimum charge, 50 cents. Payment should be made upon receipt of invoice. Copies of United States patents may be obtained from the U. S. Patent Office, Washington, D. C., for 10 cents each. Send currency not stamps.

Sulphite Process

Production of Pulp and Treatment of Residual Liquors. Linn Bradley and Edward P. McKeefe assignors to Bradley-McKeefe Corp. Can. Pat. 301,643, (July 1, 1930).—Wood is digested by an acid cooking liquor supplied with a sodium sulphite under conditions to produce a bleachable chemical pulp; a second lot of wood is digested with an alkaline cooking liquor supplied with caustic soda and sodium sulphide (either with or without sodium sulphite). Residual liquor from the acid cook is concentrated and the resulting residue is treated to decompose organic matter and to obtain some sodium sulphide. Some of this sodium sulphide is subsequently employed in the alkaline cooking liquor referred to above. Residual liquor from the alkaline cook is concentrated and the resulting residue treated to decompose organic matter and to obtain some sodium carbonate. Some of this is utilized in producing a sodium sulphite and the latter is used in cooking liquor for the acid digestion treatment.—A.P.-C.

Tanning Composition from Sulphite Waste Liquor. W. E. Byron Baker. U. S. pat. 1,754,600, (June 17, 1930).—In making sodium lignosulphonate with production of a product containing calcium by neutralization and concentration of sulphite waste liquor, the calcium is removed by interchange with the sodium of a zeolite, and the sodium lignosulphonate is recovered and is acidified with an organic acid having a relatively low dissociation constant.—A.P.-C.

Lignin Gel from Sulphite Waste Liquor. W. E. Byron Baker and Fred G. Roberts. U. S. pat. 1,764,601, (June 17, 1930).—In the production of lignin in the form of a reversible colloid gel devoid of lignosulphonic acid, sulphite waste liquor is treated with chromic acid solution, and the gel is washed with water.—A.P.-C.

Recovery of Sodium Sulphite Waste Liquors. Linn Bradley and Edward P. McKeefe assignors to Bradley-McKeefe Corp. Can. Pat. 301,642, (July 1, 1930).—In the production of chemical pulp, the material is digested with a cooking liquor containing considerable sodium sulphite and a less amount of sodium thiosulphate. The residual liquor is separated from the pulp, the water is removed, and the organic compounds are decomposed by heating in a current of hot gases; in this process a substantial amount of sulphur is eliminated and the resulting ash contains more sodium carbonate than sodium sulphide. The sodium compounds thus produced are dissolved and causticized with lime and the causticized liquor is used to digest fiber-bearing material. The residual liquor from the pulp thus produced is separated, the water removed and the organic compounds decomposed by heating in a current of hot gases; some sulphur is thus eliminated and the resulting ash contains considerably more sodium carbonate than sodium sulphide. The resulting sodium compounds are dissolved and sulphited to produce a cooking liquor which contains considerable sodium sulphite and a less amount of sodium thiosulphate, and the cycle is repeated one or more times.—A.P.-C.

Beating

Beating of Paper Pulp. IV. Beaten Pulp. M. Nakano. J. Cellulose Inst. (Tokyo) 5, 264-269, 283-290 (1929).—The wetness of beaten pulp is increased by stirring and the higher the pulp consistency the greater the increase of wetness. Beaten pulp does not combine chemically with water, but the latter is held as water of imbibition. Dilute solutions of acid and alkali and mercuric chloride solution prevent increases of wetness on keeping, and treatment with boiling alkaline solution of any concentration causes loss of wetness. Brown mechanical wood pulp increases in wetness after bleaching. The wetness of a mixture of two different pulps cannot be calculated from that of the components. The swelling of cellulith and vulcanized fiber in water has been observed over a period of about 100 days by weighing the water taken up by them, but no syneresis was found. The true degree of beating of the pulp, i. e., its wetness after boiling, depends on the mean dimensions and the mean modulus of elasticity of the fibers, whilst the wetness lost by boiling depends on the mean dimensions of the beaten fibers and on the water of imbibition.—A.P.-C.

Beating of Paper Pulp. V. Relation Between Time and True

Degree of Beating. M. Nakano. J. Cellulose Inst. (Tokyo) 5. 317-326 (1929).—The effect of beating stuff in the ball mill has been investigated from the point of view of wetness. Apparatus is described with which the degree of wetness can be measured. As previously shown (preceding abstract) the apparent wetness W, may be divided into two parts, namely, the true degree of beating, Wm, and the wetness Wa, due to water of hydration or imbibition, which is readily removed by boiling. The latter has no effect on the beating action. The relation between Wm and the time of beating or number of revolutions of the mill (x) is expressed by straight lines when $Wm - k$ (where k is a constant of the apparatus) is plotted against x on semilogarithmic paper. From such straight lines the equation $W' = W_0 e^{ax}$ is deduced, where $W' = Wm - k$, W'_0 is the initial degree of beating obtained from the graph, and a is the slope of the straight line. The agreement between observed and calculated values of W' in wood, but observed values at the beginning of beating do not agree with the computed values; also the formula ceases to hold when the stuff is so far beaten that paper made from it begins to parchmentize. Over a certain range, however, the true corrected degree of beating increases with time according to the compound interest law.—A.P.-C.

Beating of Pulp. XI. A Characteristic of Vegetable Fibers as Paper Making Materials. M. Nakano. J. Cellulose Inst. (Tokyo) 6, 144-147 (1930).—Wool, silk, asbestos, and vegetable fibers were beaten, and their paper-forming properties compared. Wool cannot be split longitudinally, but is reduced to short lengths showing no fibrillation, from which it is impossible to form a sheet. Silk and asbestos split into fibrils, but the sheets formed from the products were weak owing to the slippage of the fibers. It follows, therefore, that fibrillation is not necessarily accompanied by the development of the adhesive properties which are essential to the production of satisfactory sheets. Only vegetable fibers have these characteristic properties, which are due to the colloidal state of the surface of the fibrils, and their felting capacity is of secondary importance.—A.P.-C.

Refining Engine. Herman Mallickh. U. S. pat. 1,763,532 (June 10, 1930).—The machine consists of a cylindrical or conical roll equipped with knives, enclosed in a suitable casing, and coacting with one or more bed plates extending longitudinally of the roll. The casing is provided with a chamber at one or both sides, in which are walls or baffles to deflect the pulp and direct it in a helical patch around the roll, the stock being continuously fed in at one and discharged at the other.—A.P.-C.

Continuous Beating. J. D. Haskell, Paper Mill 53, No. 18, 14, 16, 21 (May 3, 1930).—An outline of the development of the continuous beaters, with a brief description of the types constructed by Dilts Machine Works and discussion of their merits. —A.P.-C.

Continuous Breaking and Beating of Waste Paper. B. Ivar Humble. Paper Trade J. 91, No. 1, 49-51 (July 3, 1930).—Data are given on the performance of Shartle breaker beaters and settling systems in a number of board mills, and of Shartle breaker beater systems in a number of de-inking plants.—A.P.-C.

Beating to Make Paper. Arthur B. Green. Paper Industry 12, 708a-708b (July, 1930); Paper Mill 53, No. 28, 4, 14 (July 12, 1930).—A discussion of the importance of knowing the effects produced on the fibers by the beaters under given conditions in order to be able to produce paper possessing the desired characteristics.—A.P.-C.

Papermaking Topics. F. J. T. Heckford. World's Paper Trade Rev. 93, 2250 (June 20), 2330-2334 (June 27, 1930).—A brief discussion of "hydration." With the evidence of 40 years' association with "wet" stuff, the author is certain that no chemical union takes place between cellulose and water during beating, the qualities that "wet stuff" imparts to paper being attributed to the flattened, flexible fiber and cell.—A.P.-C.

Beater. S. Milne. Eng. pat. 327,581 (April 13, 1929).—The roll or the bed plate is supported on a lever system allowing automatic increase of the pressure, progressively, as the beating proceeds.—A.P.-C.

Developments in Beater Design. W. F. Hathaway. Paper Industry 12, 857-859 (Aug. 1930).—A review of improvements in the design of beaters.—A.P.-C.

Beating Apparatus. Charles H. Kirsoaf assignor to The Lang Co. U. S. pat. 1,754,519 (April 15, 1930).—A control plate is hinged at or near the top of the backfall and parallel to the axis of the beater roll. By varying its inclination (that is, the distance of the free edge of the plate from the roll) the relative amounts of material carried around by the roll and of material passing over the backfall can be regulated. The stock passing around the roll is received in a trough or gutter from which it may be returned to the trough of the same beater, or delivered to another beater, or partly to each. As the finer stock has a greater tendency to adhere to the roll than the coarser stock, the less material is permitted to pass around with the roll, the finer it will be. A number of beaters may be associated together, each succeeding one being adjusted to beat the stock finer than the preceding one, the stock being fed continuously or at short intervals to the first one and removed continuously from the last one.—A.P.-C.

Rag Catcher for Beaters. Harvey E. Marvel assignor to S. F. Bowser and Co., Inc. U. S. pats. 1,760,509 to 1,760,511, (May 27, 1930.—No. 1, 760,509—A series of curved fingers are mounted on a frame which can be lowered into and raised out of the beater trough. A series of dumping arms are associated with the fingers, preferably one arm for each second finger, so that when the fingers are raised out of the trough, the bars are automatically brought into action to dump the rags that have accumulated on the fingers into a suitable trough. No. 1,760,510 provides a spray for washing the rags off the fingers, the spray coming into action automatically when the fingers have been raised to a given height and being closed automatically. No. 1,760,511—The fingers are mounted on a frame which can be vertically raised out of or lowered into the beater trough. After raising them out of the trough the frame carrying the fingers is pivoted to bring them to the side of the beater trough where the rags are dumped into a trough, cart, etc.—A.P.-C.

Beater. A. E. Reed & Co., Ltd., and C. D. Sheldon, Eng. pat. 325,601.—The bed-plate is arranged to rock along a predetermined arc concentric with the beater roll.—A.P.-C.

Automatic Consistency Control in the Paper Mill. Sidney E. Meyers. Paper Mill 53, No. 37, 10, 12, 34 (Sept. 13, 1930); Paper Trade J. 91, No. 66-68 (Sept. 18, 1930).—The Merritt consistency regulator is of the type which obtains its regulating impulse from an agitator revolving at constant speed within the stuff to be regulated. The body of the machine is placed upon suitable supporting members at the top of the stuff box and the agitator is suspended from the driving mechanism, the agitator shaft being guided by a bearing at its lower end. The power-transmitting chain has its tight or driving strand uppermost and supports a floating member by means of a roller carried by the floating member which is vertically movable under the limitation and control of an adjustable spring. The vertical movement of the floating member is transmitted directly to a balanced V-port water valve above the main housing controlling the addition of water to the stock. The merits and performance of the instrument are discussed.—A.P.-C.

Measurement of Consistency by Light Absorption. J. S. Hart, O. Maass and H. W. Johnston. Paper Trade J. 91, No. 15, 52-54 (Oct. 9, 1930).—An apparatus has been devised which is capable of measuring accurately the absorption of light by sus-

pensions of wood pulp. Using a constant head of water permits results to be reproduced accurately for the same stock within the limits of experimental error. Unknown consistencies can be determined for stocks whose characteristics are known. Further investigations are expected to take the form of isolating variables affecting the absorption curves, namely, particle size, color and nature of the stock. When this has been accomplished it is hoped to obtain mathematical relations connecting these variables and apply them to the simultaneous measurement of consistency and particle size of unknown samples.—A.P.-C.

TAPPI Notes

R. H. Dines, formerly manager of the Fibre Products Division of the U. S. Rubber Company, Rock City Falls, N. Y., has joined the organization of Wallace & Tierman, Newark, N. J.

C. Nelson Gain has resigned as mill manager of the Interlake Tissue Mills, Merritton, Ontario. Mr. Gain has not as yet made definite plans for the future and may be reached at 82 Yates Street, St. Catherines, Ont.

W. Ronald Benson, who was until recently chemist at the National Paper Products Company mill at Port Townsend, Wash., is now attending the University of Washington.

F. N. Beveridge who resigned as general superintendent of the Hummel-Ross Company was in town this week. He has not made any definite plans for the future and may be reached at 1015 Pecan avenue, Hopewell, Va.

W. F. Goldsmith, of A. D. Little, Inc., has been appointed technical director of the newly organized Hawaiian Cane Products Company of Hilo, Hawaii. Mr. Goldsmith's headquarters will be in San Francisco, Cal.

To correct a note published recently, H. C. Press is a member of the research staff of the Oxford Paper Company, Rumford, Maine.

C. E. Curran, chief of the Forest Products Laboratory Pulp and Paper section, left March 23 on a month's field study of pulping species in the western forest districts. Dr. Curran will visit U. S. Forest Service headquarters in Denver, Albuquerque, Flagstaff, Los Angeles, San Francisco, and Portland. He will address the Pacific Section of the Technical Association of the Pulp and Paper Industry at Everett, Wash., on April 18. His subject will be "A Review of Current Research at the U. S. Forest Products Laboratory."

S. L. Willson Club Meets

The S. L. Willson Club of the American Writing Paper Company, Inc., held its March meeting at the general office of the company on Tuesday evening.

R. W. Pattison, president of the club presided and introduced R. B. MacDougall, assistant general sales manager, who spoke to the members on "Methods of Selling and Merchandizing of the American Writing Paper Company, Inc." Mr. MacDougall's talk was well presented, showing a comparison between the old day methods of selling and modern methods. C. H. Smith, secretary and treasurer, read the minutes of the meeting. Russell Madden, vice-president in charge of sales also added a few remarks.

Claremont Paper Co. Closes Bellows Falls Mill

[FROM OUR REGULAR CORRESPONDENT]

BELLOWS FALLS, Vt., March 31, 1931.—The Claremont Paper Company of Claremont, N. H., closed its branch mill the past week here and moved part of its office contents to Claremont. When running full this mill employed about 40 persons. The understanding in this town is that the reopening of the mill is uncertain due to the competition of hard pine in southern mills. The mill was built about 45 years ago by the late A. H. Fisher. It was later taken over by Wyman Flint & Sons and still later acquired by the Claremont Paper Company.

Carthage Machine Co. Joins TAPPI

Many companies have indicated in their advertising their desire to contribute to the welfare of the paper industry. The companies that have been most sincere in this objective have become members of the Technical Association of the Pulp and Paper Industry. They have thereby become an integral part of the industry and are in the most advantageous position to definitely serve the superintendents, technical executives, engineers and chemists of the mills.

The corporation that has most recently become a member of TAPPI is the Carthage Machine Company of Carthage, N. Y, which has been making a study for many years of the design and manufacture of machines for the most economical preparation of wood in the groundwood and sulphite pulp mills.

The principal machines manufactured by the company are as follows: wood splitters, barkers, chippers (with the patented adjustable bed knife), chip screens (flat and rotary), grinders, wet machines, deckers, cylinder moulds, shredders (for either frozen or dry lap pulp), bronze blow valves and digester fittings, stock pumps (for acid or water), and wood washers.

The well known Carthage chipper was originally designed from a chipper built in the old country. As a result of the suggestions from users and from the company's engineers, the design has been improved from year to year until today we have the excellent Carthage chipper which is a direct connected unit with a steel disc, roller bearings, improved end thrust and the spout with the patented adjustable bed knife. The saving in power by this unit is large and the even speed and new end thrust give uniform chips and but little sawdust, with a minimum of knife and belt expense.

Although the company was incorporated in 1894, its predecessors were pioneers in the pulp and paper industry. Today, the active officers are A. F. Wardwell, president A. K. Hinds, vice-president, and N. P. Wardwell, assistant to the president. A. F. Wardwell will represent the Carthage Machine Company in the Technical Association.

Water Turbine Patent Assigned to I. P.

[FROM OUR REGULAR CORRESPONDENT]

ALBANY, N. Y., March 31, 1931.—A patent on a water turbine has been issued to Clark A. Terry, supervisor of power plants for the New York Power and Light Company, the application having been made in 1925. The inventor has assigned the patents rights to the International Paper Company, with which firm he was formerly connected. The new turbine develops a principle of the infection of air in order to increase efficiency and smoothness of operation and is understood to be capable of developing 50,000 hp.

Heller & Merz Donate Dyestuffs

Dr. Otto Kress, technical director of the Institute of Paper Chemistry, Appleton, Wis., writes: "In the March 19 issue of the PAPER TRADE JOURNAL on page 24, I note the publicity which you have given to the collection of dyestuffs recently donated to the Institute of Paper Chemistry by the Calco Chemical Company of Bound Brook, N. J. Unfortunately, the person who supplied you with this information should have stated that these samples were obtained through the courtesy of the Heller & Merz Corporation, as well as through the Calco Chemical Company.

C. K. Spaulding Gets New Honors

[FROM OUR REGULAR CORRESPONDENT]

PORTLAND, Ore., March 27, 1931.—Charles K. Spaulding President of the Spaulding Pulp and Paper Company, Newberg, Ore., who was appointed a member of the state senate during the last legislature to succeed the late Senator Lloyd T. Reynolds, has now also been appointed a member of the state highway commission to succeed C. E. Gates. Mr. Spaulding will hold both positions hereafter.

Further Study Of Paper-Coating Minerals And Adhesives *

By Merle B. Shaw,[1] George W. Bicking,[1] and Martin J. O'Leary[1]

The characteristic feature of mineral-coated paper is a thin layer of mineral matter and adhesive applied to the surface of the fiber sheet. The function of the mineral matter is to fill in the irregularities of the surface of the sheet to form a smoother and more even surface than that obtained by the other paper-manufacturing processes, while the adhesive is added to bind the particles of mineral matter together and to the body of the paper. There are many grades and uses of coated papers, and the coating materials employed are chosen according to the use for which the papers are intended. The tests described in the following pages, however, have been confined to papers for high-grade printing and lithographic purposes, for which a very even, semi-absorbent surface is required.

An investigation was previously made at the bureau to obtain data on the use of glue as adhesive in such types of coated paper. The work is fully described in Bureau of Standards Technologic Paper No. 323,[2] published in 1926. Consideration was given to the factors which materially influence the quality and price of the glue, and the printing quality of glue-bound coated papers. Eight different glues were used, with clays, satin white, and blanc fixe as the coating minerals.

Owing to the interest manifested by manufacturers in the previous work, other paper-coating materials have recently been studied to keep the public informed of new developments in raw materials and promote the use of domestic resources, which would become very important in the event of any disturbance limiting the supplies of foreign origin. The present paper describes these later tests, which are a continuation of the earlier work.

Materials Used in the Investigation

1. Paper

The base paper or body stock used for the coating tests was composed chiefly of sulphite pulp with some waste paper from experimental paper runs, and was medium rosin sized. The weight of the stock was approximately 54 pounds (500 sheets 25 x 40 inches in size). The paper was made on the Fourdrinier machine of the bureau's experimental paper mill, and was similar in its properties to that generally used in commercial coating mills.

The fibrous part of coated paper is sometimes regarded as a mere carrier of the coating and for this reason is sometimes very poor material. The quality of the body paper—its formation, cleanliness, color, and surface characteristics—is, however, of considerable importance. For good results in coating it is essential that the paper be well closed and the surface smooth and even. If it is too soft sized the coating mixture premeates too deeply and a poor bond between mineral and paper results. If it is too hard sized the coating will not adhere well to the surface. Freedom from surface dirt, specks, rosin, or lime spots, and other imperfections which may cause a local thinning or thickening of the coat is necessary to insure uniform distribution of the coating on the body stock. The color of the base paper is a factor in the appearance of the coated sheet. The more nearly it corresponds to the color of the coating, the more satisfactory will be the results obtained.

2. Coating Materials

(a) Minerals

Four different coating clays—two foreign, two domestic—and a commercial compound of domestic diatomaceous earth,[3] designated herein as mineral No. 5, were the minerals employed. The foreign clays were graded as No. 1 and medium. The two domestic clays were from the same mine, but had received different refining treatment. One, clay A, had been washed only; the other, B, had been chemically treated, bleached, and washed. The following chemical analyses, color measurements, and settling data (Tables 1 to 3) give additional information on these materials.

TABLE 1—CHEMICAL ANALYSES OF COATING MINERALS[1]

Constituents	Foreign clay No. 1 Per cent	Foreign clay Medium Per cent	Domestic clay A Per cent	Domestic clay B Per cent	Mineral No. 5 Per cent
Silica (SiO_2)	46.7	46.2	44.4	44.3	28.4
Iron oxide (Fe_2O_3)	.7	1.0	.4	.4	.4
Alumina (Al_2O_3)	37.5	37.6	39.8	41.0	.8
Calcium oxide (CaO)	Trace.	Trace.	Trace.	Trace.	47.6
Magnesium oxide (MgO)	.3	.5	.5	.1	.7
Loss at 110° C. (2 hours)	.4	.3	.6	.4	2.2
Further loss on ignition	12.4	12.5	13.7	14.0	20.0
Specific gravity at 15.6° C[3]	2.71	2.75	2.67	2.70	2.63

[1] Analyses made by chemistry division, Bureau of Standards.
[2] Includes TiO_2, P_2O_5, Mn_3O_4 if present.
[3] Specific gravity determined by A. S. T. M. method D 153-27.

Clays consist of finely divided mineral matter, chiefly silica and alumina, derived from rocks by disintegration. They may be either residual or transported. The residual (or primary) clays are those which remain overlying the rocks from which they have been formed, and they are thus distinguished from transported (sedimentary or secondary) clays, which have been carried from their place of origin by eroding influences and redeposited. Because of the largeness of the deposits and their residual character, foreign clays are in their natural state considered homogeneous. The majority of American clays are transported and, therefore, may contain more impurities. For this reason more at-

[3] Fine powder obtained from the accumulated deposits of diatoms, microscopic unicellular algae remarkable for their silicified cell walls, which persist after the death of the organism.

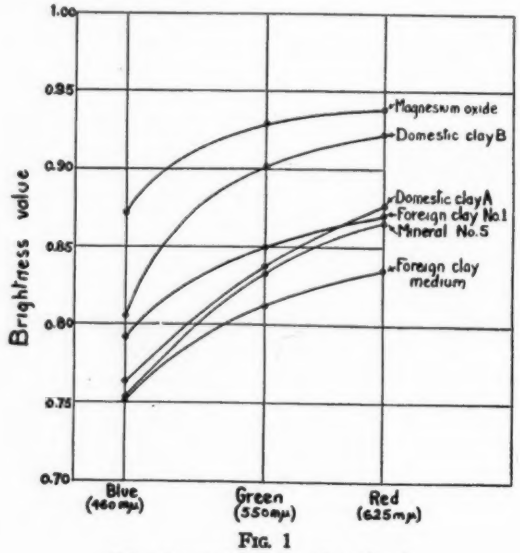

FIG. 1
Color characteristics of coating minerals.

* Presented at the annual meeting of the Technical Association of the Pulp and Paper Industry, New York, N. Y., Feb. 17-19, 1931.
Contribution of the Finishing, Processing and Converting Committee.
[1] Paper Section, Bureau of Standards, Washington, D. C.
[2] Use of Glue in Coated Paper, by George K. Hamill, V. H. Gottschalk, and George W. Bicking. Copies may be obtained from the Superintendent of Documents, Government Printing Office, Washington, D. C. Price 15 cents each.

tention in refining is needed for the American clays, but by modern improved methods of handling and purification, the extraneous substances are reduced to a satisfactory minimum, and the American clays now available are greatly improved.

As shown in the chemical analyses of Table I, the domestic clays tested were similar to the foreign clays in composition. Mineral No. 5 had a very high lime content. The low moisture content of the clays, "loss at 100 deg. C.," was doubtless due to the fact that they had been kept in a dry place for a considerable time before the tests. Under "further loss on ignition" is given the loss chiefly of chemically combined water and organic matter.

The color or degree of whiteness is important in the selection of minerals for use in high-grade papers. A Pfund colorimeter,[4] which gives numerical values as a basis for comparison, was used to determine the color characteristics reported in Table II and shown graphically in Fig. 1. Magnesium oxide was included with the samples in order to give a value of white for comparative purposes.

TABLE 2—COLOR MEASUREMENTS OF COATING MINERALS[1]

	Brightness values		
	Blue (wave length 460 mμ)	Green (wave length 550 mμ)	Red (wave length 625 mμ)
Magnesium oxide[2]	0.871	0.928	0.937
Foreign clay No. 1	.791	.850	.870
Foreign clay medium	.750	.812	.834
Domestic clay A	.753	.838	.876
Domestic clay B	.807	.901	.922
Mineral No. 5	.753	.834	.869

[1] Measurements made by R. E. Lofton, Bureau of Standards.
[2] Magnesium oxide was included for comparison.

The color characteristics are shown in terms of the relative brightness of the three primary components—blue, green, and red. If the sample being tested were truly color neutral, "white" or gray, it would reflect nonselectively and the brightness values for the three colors would be the same. The color curve would be a straight, horizontal line, but since white has a higher brightness value than gray the curve for white would be higher on the vertical scale. As the color becomes more selective; that is, shows a tint or dominant hue, the values for the reflection coefficient diverge.

As shown in Fig. 1 the domestic clays are somewhat more deficient in blue (that is, are more yellowish) than the foreign clays, but higher in brightness. The refining treatment given clay B improved its color characteristics. If a small amount of blue

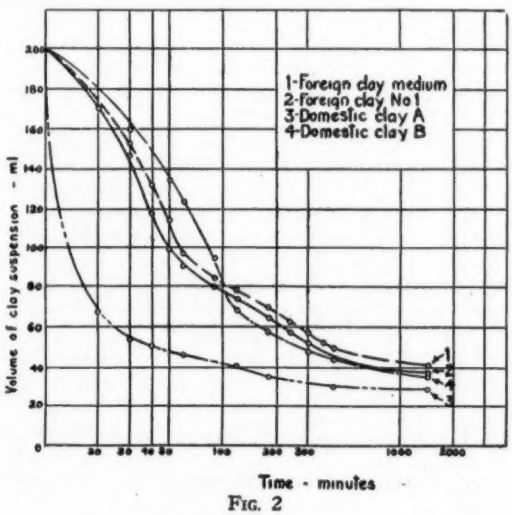

FIG. 2

Rate of settling of clay in water $\left\{\frac{W}{C} = \frac{19.6}{1}\right\}$

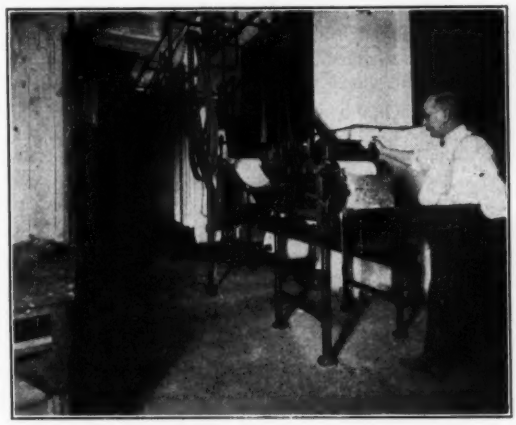

FIG. 3

Paper coating machine (without drying cabinet. Paper shown festooned for drying).

dye were added with the clay, it would doubtless be as good in color as the foreign clays. Its color curve would then be more nearly horizontal, but the brightness values would be somewhat lower.

The relative rates of settling from water suspensions are shown for the different clays in Table 3 and Fig. 2. Using a water-clay ratio of 19.6 to 1,200 ml of clay slip (clay content, 10 g) was placed in a graduated glass cylinder and the volume of clear supernatant liquid determined at various times. No electrolyte was added to deflocculate the clays.

The curves of Fig. 2 afford a fairly accurate comparison of the fineness of the clay particles. The washing and chemical treatment of clay B apparently removed some of the coarse particles. It may possibly also have developed some colloidal property which increased the suspending quality of the clay. Whereas domestic clay A settled comparatively rapidly, the settling rate and final volume of wet clay were practically the same for domestic clay B as for the foreign clays. Fineness of grain and good suspension quality are essential to a free-flowing coating slip that will spread well on the paper and have good covering power. It is believed a clay of fine particle size will also take a better finish.

The water used for the slips had a pH value of 6.9, which is practically neutral. The pH of the clear liquid above the clay suspensions was 7.1 for foreign clay No. 1, 6.7 for foreign clay medium, 5.5 for domestic clay A, and 6.0 for domestic clay B; that is, the foreign clays were nearly neutral, whereas the domestic clays were somewhat acid in character. The corresponding value for the diatomaceous earth compound was 8.4.

[4] Pfund, A. H., A New Colorimeter for White Pigments and Some Results Obtained by Its Use, Am. Soc. for Test. Matrls.; June, 1920.

TABLE 3—RATE OF SETTLING OF CLAY IN WATER

200 ml of clay slip; $\frac{W}{C} = \frac{19.6}{1}$

Time interval		Clear liquid above clay suspension			
		Foreign clay		Domestic clay	
Hr.	Min.	No. 1 ml	Medium ml	A ml	B ml
0	0	0	0	0	0
0	10	13	7	77	14
0	20	30	27	133	27
0	30	53	47	145	40
0	40	82	68	149	52
0	50	99	86	151	65
1	00	109	103	153	76
1	15	115	112	155	90
1	30	120	116	157	105
1	45	123	119	158	120
2	00	126	122	159	132
2	30	132	125	162	138
3	00	136	130	165	142
3	30	139	134	166	144
4	00	142	137	167	146
5	00	147	142	168	150
6	00	152	146	169	153
7	00	155	150	170	155
24	00	162	160	171	164

(b) Adhesives

Three types of adhesives were used in the coating work—casein, glue, and modified, or chemically treated, starches. Three samples of the modified starches, called "gums" by the manufacturer, were employed and are designated herein as gums A, B, and C.

All of the adhesives employed were high-grade commercial products. The glue was the same as the No. 4 adhesive used in the earlier work.[5] The coating gums were described by the manufacturer as follows:

"These coating gums were made from cornstarch by chemical processes consisting essentially of weak esterfication at low temperature with relatively weak organic acids, yielding products which tend toward slight acidic hydrolysis in the course of drying of the films. During the course of manufacture the starches were treated with soluble silicates, so that during the acidic hydrolysis the silicates are converted into silica gel in situ, and there is produced during the drying of the adhesive in contact with the clay coat, a combination of starch and silica gel. The silica gel assists in the bonding of the starch and clay and renders the coat somewhat more resistant to the leaching effects of water than is obtainable with the ordinary types of soluble starches previously used for such purposes."

All of the adhesives possessed the qualities given in Technologic Paper No. 323 as desired in adhesives for coating purposes, namely:

"Minimum of insoluble matter, such viscosity as to permit the use of ordinary equipment at the desired dilution of the coating mixture and within the temperature range of working conditions, high adhesiveness, good clay-suspending power, and minimum of foam-causing impurities and grease."

Equipment Used

The paper mill of the bureau is equipped for coating paper on a semicommercial scale under practical mill conditions. The equipment employed consists of a 14-inch Waldron flat-bed brush coater with festoon dryer and rewinder, mixing tanks with power-driven agitators of the wooden-gate type, and a 5-roll supercalender.

The coating machine is the "single" coater type, applying the coating substance to but one side of the paper. It has 6 brushes, 2 rotating and 4 having a laterally reciprocating movement, to spread and smooth the coating material. The brushes, the first of which consists of comparatively coarse bristles and the last of fine, are placed in the following order: One rotating which applies the coating substance, one working across the surface of the paper with a reciprocating motion, another rotating, and three more reciprocating, the last having very fine badger bristles to eliminate any remaining marks made by the coarser ones. The pressure of the brushes on the paper can be adjusted so as to distribute the coating materials uniformly and smoothly over the paper.

[5] B. S. Tech. Paper No. 323, p. 647.

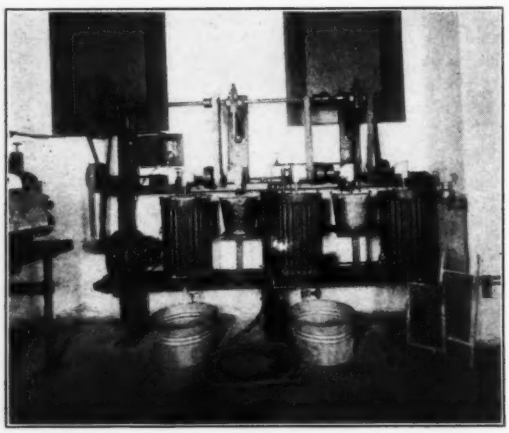

FIG. 4
Mixing vessels.

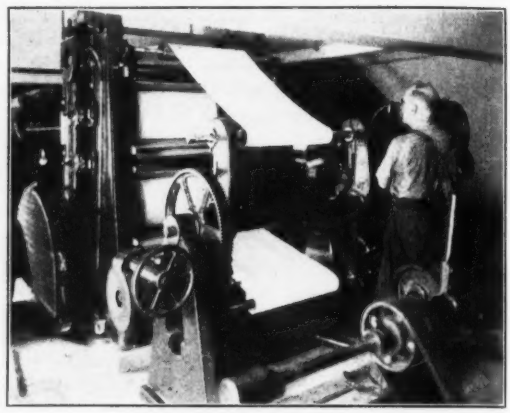

FIG. 5
Supercalender.

The festoon rack is 15 feet long and has a capacity of 28 loops, each 6 feet in length. With the uptake rack and the rack from the festoons to the reel, the capacity of the dryer is approximately 400 lineal feet. The dryer is inclosed in a cabinet equipped for air conditioning and temperature control. The photograph of Fig. 3, however, was made before the cabinet was installed.

The mixing tanks used for preparing the coating mixtures are shown in Fig. 4.

The supercalender (Fig. 5) is equipped to calender paper either in the web or in sheets. The drive is such that the calender can be run at almost any speed desired. The lever-weight arms are raised or lowered hydraulically. The calender is supplied with 3 steel and 3 cotton rolls, so that the rolls can be alternated or the 3 cotton rolls can be used together.

Coating Procedure

1. PREPARATION OF COATING MIXTURE

The clay used in the coating mixtures was soaked in water overnight in order that it might become thoroughly wet before the slip was prepared. The slip was agitated for approximately one hour, after which the adhesive was added. The resultant coating mixture was agitated until uniform, the time required being from one to two hours.

The adhesive materials were added in solution. The casein and glue formulas developed and adopted in the earlier work and the formula recommended for the gums by the manufacturer were followed in the tests on the respective materials.

The casein was soaked for one hour at room temperature in approximately four times its weight of water and was occasionally stirred meanwhile. Since casein is insoluble in water, it was brought into solution by adding alkali solvents and heating the mixture to 130 to 150 deg. F. The solution was allowed to cool to room temperature before it was added to the clay slip. Soda ash is probably the best solvent, or cutting alkali, for casein, but small amounts of borax, ammonia, and trisodium phosphate (alone or in combination) are used by mills with very satisfactory results. Nearly every manufacturer has a formula of his own, largely determined by the mill's coating process and the requirements of its customers.

The glue was soaked in water overnight and subsequently warmed to not more than 135 deg. F. for solution. The solution was allowed to cool to room temperature before it was added to the clay slip.

The gums were mixed with water, heated at 185 deg. to 190 deg. F. until the solution was amber in color, and, as recommended by

the manufacturer, added while hot to the clay slip, which was at room temperature.

After being screened through a No. 200 sieve the coating mixtures were ready to be applied to the body paper. The small scale coating equipment employed did not permit using the relatively high concentration used with commercial equipment, therefore, the mixtures were of lower concentration and the coatings obtained were consequently of comparatively light weight.

2. Coating

The coating procedure was similar to the commercial practice used in applying a single coating to paper. A roll revolving in the prepared coating mixture transferred the coating substance to a revolving brush, which, in turn, applied it to the surface of the paper. By means of the series of brushes pressing against the paper as it passed over the flat bed of the machine, the mixture was immediately smoothed out and brought into good contact with the paper. After leaving the brushes the paper was hung in a series of festoons or loops and carried along on an overhead trackway through the drying gallery, heated by hot air rising from near the floor, and then reeled up ready for calendering.

In order to sufficiently dry the coated paper in the short time required for it to pass through the cabinet, it was necessary to shut off the humidifying feature of the equipment. The moisture content of the paper entering the cabinet was approximately 35 per cent, and the interval permitted for drying was about 10 minutes (for 400 feet). If the paper admitted had been low in moisture content or could have been left longer to become dry and conditioned, the automatic humidity control would have been used. The temperature of the drying cabinet was from 110 to 120 deg. F., but the paper was kept comparatively cool by the rapid evaporation caused by the large volume of warm air circulated from beneath.

3. Calendering

A combination of alternate steel and cotton rolls was used in calendering the paper, which was passed through in the web. No attempt was made to obtain a high glossy finish, the smoothness imparted by light calendering being sufficient for high-grade printing except for special cases.

Test Results

1. Coating of Paper

(a) Minerals

The clays worked satisfactorily with the different adhesives. No attempt was made, however, to determine the minimum amount of each adhesive that could be used with them. The suspension quality of the clays was good, the coating mixtures screened satisfactorily, and the slips were spread without difficulty by the coating machine. Nearly any finish desired could have been obtained in the calendering but 70 per cent gloss[6] was the finish arbitrarily adopted.

The measurements on the coated papers are given in Table 4.

As indicated in the table the coatings showed about the same differences in color as the clays themselves; that is, the coated paper for which domestic clay B was used was somewhat better in color than that coated with sample A, and compared favorably with the color of the papers coated with the foreign clays. There appears to be no appreciable difference in the adhesives so far as their effect on the color of the coatings is concerned. Since starch is comparatively a very white material it might be expected to affect the color least, with casein and glue following in order, but these differences were not shown in the measurements. The weight of the single coat applied was approximately from 10 to 15 pounds on a basis paper 25 by 40 inches, 500 sheets.

Mineral No. 5 is primarily a ceramic material, but because of its softness and fineness was thought to be a possible coating mineral. Casein and glue were used as the adhesives in the coating tests. When the casein mixture was added to the slip of mineral and water the resultant mixture was very fluid, whereas when the glue solution was added to the mineral slip the mixture was very

[6] The gloss of the finished papers was determined according to the Paper Testing Methods published by the Technical Association of the Pulp and Paper Industry, 370 Lexington Ave., New York, N. Y.

[1] Color and gloss measurements made by W. L. Holt, Bureau of Standards.
[2] Solids include coating mineral, adhesive, and chemicals used in the coating mixture.
[3] Specific gravity determined by hydrometer method.
[4] Measurements made without color filter.
[5] Body stock for these tests different from that for the preceding.
[6] Results obtained with mineral No. 5 were unsatisfactory, as shown in text, therefore, measurement on the papers coated with this mineral were not made.

TABLE 4—COATING MIXTURES AND MEASUREMENTS ON THE FINISHED COATED PAPERS[1]

	Coating mixture								Coated paper					
	Mineral		Water added to mineral	Adhesive		Water added to adhesive	Ratio of water to solids[2]	Density[3]	Weight (25 by 40 inches, 500 sheets)		Color measurements (Brightness values)			
Run No.	Kind	Amount		Kind	Amount			Sp. gr. °F.	Body stock Pounds	Coated paper Pounds	Blue (wave length 460 mμ)	Green (wave length 550 mμ)	Red (wave length 625 mμ)	White[4]
		g	g		g	g								
133	Foreign clay No. 1..	2,000	2,500	Casein	350	1,500	1.9-1	1.24 at 77	54.2	68.2	0.769	0.864	0.912	0.867
134	do	2,000	2,500	do	350	1,500	1.9-1	1.24 at 76	54.2	67.6	.778	.871	.923	.878
143	do	2,000	2,500	Glue	250	2,000	2.0-1	1.24 at 81	54.2	65.4	.765	.858	.907	.868
149	do	2,000	3,000	Gum A	480	1,500	2.2-1	1.20 at 30	54.2	68.4	.756	.854	.914	.872
151	do	2,000	3,000	Gum B	480	1,500	2.0-1	1.25 at 89	54.2	73.4	.755	.853	.909	.870
152A	do	2,000	3,000	do	360	1,500	2.1-1	1.23 at 89	54.2	66.2	.767	.858	.908	.873
152B	do	2,000	3,000	do	360	1,500	2.4-1	1.20 at 80	54.2	62.6	.762	.853	.913	.874
153A	do	2,000	3,000	do	240	1,000	1.8-1	1.27 at 88	54.2	70.1	.783	.861	.920	.881
153B	do	2,000	3,000	do	240	1,000	2.2-1	1.22 at 88	54.2	63.6	.786	.864	.922	.878
135	Foreign clay medium	2,000	2,500	Casein	350	1,500	1.9-1	1.25 at 76	54.2	63.5	.756	.858	.906	.863
136	do	2,000	2,500	do	350	1,500	1.9-1	1.25 at 78	54.2	70.9	.751	.857	.899	.865
137	do	2,000	2,500	do	350	1,500	1.9-1	1.24 at 82	54.2	68.9	.747	.850	.898	.858
144	do	2,000	2,500	Glue	250	2,000	2.0-1	1.24 at 83	54.2	65.5	.741	.848	.896	.853
138	Domestic Clay A...	2,000	2,500	Casein	350	1,500	1.9-1	1.25 at 77	54.2	72.3	.752	.867	.913	.869
139	do	2,000	2,500	do	350	1,500	1.9-1	1.24 at 80	54.2	70.3	.744	.853	.907	.862
142	do	2,000	2,500	do	350	1,500	1.9-1	1.24 at 80	54.2	67.3	.741	.858	.912	.870
156	do	2,000	3,000	do	350	2,000	2.3-1	1.20 at 87	54.2	62.3	.763	.861	.924	.878
145	do	2,000	2,500	Glue	250	2,000	2.0-1	1.24 at 82	54.2	65.2	.743	.850	.900	.865
147	do	2,000	3,000	do	250	2,500	2.4-1	1.20 at 83	54.2	63.5	.742	.850	.908	.864
148A	do	2,000	3,000	do	250	2,000	2.2-1	1.22 at 82	54.2	68.2	.752	.852	.912	.874
148B	do	2,000	3,000	do	250	2,000	2.4-1	1.20 at 82	54.2	63.8	.747	.855	.916	.868
155	do	2,000	3,000	do	250	1,000	2.4-1	1.20 at 84	54.2	62.6	.755	.863	.924	.880
150A	do	2,000	3,000	Gum A	480	1,500	2.4-1	1.23 at 85	54.2	68.7	.732	.848	.912	.870
150B	do	2,000	3,000	do	480	1,500	2.4-1	1.23 at 85	54.2	61.9	.747	.855	.918	.871
150C	do	2,000	3,000	do	480	1,500	2.6-1	1.19 at 80	54.2	61.6	.742	.850	.914	.868
154	do	2,000	3,000	do	360	1,500	2.3-1	1.21 at 84	54.2	66.2	.728	.850	.912	.875
157	do	2,000	3,000	do	360	1,500	2.3-1	1.22 at 88	[5] 52.9	65.6	.682	.773	.827	.790
159	Domestic Clay B...	2,000	3,000	Casein	350	1,500	2.3-1	1.21 at 80	[5] 52.9	66.0	.685	.769	.822	.787
165	do	2,000	3,000	do	300	1,500	2.3-1	1.21 at 80	[5] 52.9	66.0	.671	.756	.815	.778
158	do	2,000	3,000	Glue	250	2,000	2.4-1	1.20 at 80	[5] 52.9	63.4	.672	.755	.810	.768
160	do	2,000	3,000	do	250	2,000	2.4-1	1.22 at 80	[5] 52.9	67.4	.688	.767	.820	.777
161	do	4,000	7,000	Gum B	720	3,000	2.3-1	1.22 at 80	[5] 52.9	69.1	.671	.761	.813	.769
163	do	2,000	3,000	do	360	2,000	2.3-1	1.21 at 80	[5] 52.9	70.0	.675	.766	.812	.785
164	do	2,000	2,500	do	360	3,000	2.5-1	1.20 at 84	[5] 52.9	66.1	.665	.752	.808	.767
166	do	2,000	3,500	do	360	2,000	2.3-1	1.22 at 85	[5] 52.9	66.1	.670	.758	.820	.785
162	do	4,000	7,000	Gum C	720	3,000	2.1-1	1.23 at 80	[5] 52.9	69.5	.672	.754	.808	.768
...	Mineral No. 5[6]													

thick and plastic. The coating did not hold well; that is, could be easily picked off. It was thought that the loss of binding quality of the adhesive was caused by the alkalinity of the mineral matter. (The chemical analysis, shows the lime content of the mineral to be very high.)

It was thought that the addition of alum might give a product having some of the characteristics of satin white (a prepared compound of aluminum sulphate and lime used as coating material, therefore, preliminary tests were made to determine the amount of alum required to neutralize the alkalinity of the mineral. For 100 grams of mineral 200 grams of alum was needed to make the mixture neutral. Coating runs were made, but the binding quality of the coat was still unsatisfactory.

It is believed that mineral No. 5 is unsatisfactory for use as a coating material when casein or glue is used as adhesive and handled in accordance with the usual coating procedure. There is a possibility that with a special adhesive, one that could be employed when considerable alkali (lime) is present, it might be suitable for coating use.

The color of mineral No. 5 is not so good as most grades of coating clays. The greater cost of the material as compared with good grades of clay would also doubtless be a deciding factor in its use for paper coating.

(b) Adhesives

The amount of casein employed was, except in one case, 17.5 per cent, and of glue 12.5 per cent, based on the weight of the mineral being used. The results attributable to these materials were very satisfactory, and duplicated those previously obtained. (Tech. Paper No. 323.)

In the work with the starches two different proportions of gum A, 24 and 18 per cent, based on the clay content, were employed. No trouble was experienced in the test (runs Nos. 149, 150, 154, and 157) and the adhesive quality of the gum, as judged by the sealing wax pick test,[7] which approximates the sort of surface pull received by the paper in the printing operation, was satisfactory.

In the first series of runs with gum B (Nos. 151 to 153) 24, 18, and 12 per cent of gum, respectively, were used. There seemed to be a tendency for the gum solutions to jell after being added to the clay slip. Small jell particles remained in the coating mixture even after it had been screened through a No. 200 sieve. Spots of localized variations in thickness and translucency ("bird's-eyes") were noted in the coated papers and were thought probably to have been caused by the jell particles. Graded in regard to the degree of adhesion of the coating to the body stock, the papers were in the same relative order as the amounts of gum used.

A greater quantity of water was used in preparing the gum mixture for the next runs with gum B. Whereas the ratio had been 1 part of gum to 4 parts of water in the previous runs, for runs Nos. 163 and 164, 6 and 8 parts of water, respectively, were used. It was believed that the greater dilution might prevent the formation of jell particles, but the coating was no better than that obtained when 4 parts of water were used.

In the belief that the chemical preparation of the gum might be such that when the mixture is agitated a comparatively long time the jell develops in the slip rather than on the paper during the coating and drying processes, the coating mixture for the next run (No. 168) was agitated for a shorter time, and the interval between the adding of the gum to the clay slip and the application of the coat to the paper was briefer. There was no formation of jell in the coating mixture before it was applied to the paper, and none of the trouble experienced in the previous tests was encountered.[8]

[7] The end of a stick of sealing wax is softened by warming and then applied with firm pressure to the coating. With the paper held down firmly on either side of the wax, the stick is drawn away from the paper by a steady vertical pull. If fibers from the body stock adhere to the wax, it is an indication that the coating is firmly bound and should not pick off in the printing process. The test is comparative only, and requires that the area of contact between wax and paper be the same for all samples to be compared.

Gum C was used for run No. 162. The coating was very satisfactory.

The relative effect of the adhesive on the suitability of the coated papers for writing was shown in a general way by writing on the papers with a pen and ordinary blue-black ink and noting the ease with which the operation was effected and the definition of the lines. In each case the quality of the writing was satisfactory, but the casein-bound coatings offered the least resistance to the mechanical action of the pen, the effort required in execution being greatest where starch was the adhesive employed.

2. Printing Tests

Printing tests were made at the Government Printing Office on the coated papers. The cooperation of the Government Printing Office in making the tests, which were an important part of the investigation, is gratefully acknowledged.

The experimental coated papers were substituted for the regular stock being printed by the half-tone process. No changes were made in the printing machine or the inks. The tests showed the coatings to be well bound to the body paper and of very good printing quality. Equally good results were obtained with the American and foreign clays and with the three different kinds of adhesives, although the starch-bound coatings may possibly have absorbed somewhat more ink. Both starch and glue coatings have generally been found to have less water resistance than casein coatings and, therefore, may possibly not be suitable for lithographic processes requiring a high degree of water resistance.[9]

Conclusions

The tests indicate the following general conclusions relative to the materials studied.

1. Present methods of refining American clay have improved its color, fineness, and suspension quality. American clay that had been washed and chemically treated compared favorably with foreign clays as paper-coating mineral. Diatomaceous earth compounds having a large lime content are not satisfactory when the

[8] Since the tests were made it has been found that the tendency for the gum to jell during the agitation of the clay mixture can be eliminated also by increasing the hydroxyl ion concentration of the coating mixture. Reports to the bureau of subsequent commercial mill tests stated the following:

"In light of the experience gained at the Bureau of Standards, where the pH of the coating mixture was approximately 8, it was found desirable in commercial mill tests to cook the gum at a higher pH or basicity. In the commercial runs one-half per cent, based on the weight of gum, of 26 deg. Bé. ammonia was added to the water in which the gum was to be cooked, and the gum was thoroughly stirred in the water before direct steam was admitted for cooking. The heating was either continued for a longer period or at a slightly higher temperature (approximately 195 deg. to 205 deg. F.) than was used at the Bureau of Standards. It was found preferable to judge the completion of the cooking by the color reaction of the gum, which was a deep amber when the cooking was completed. It is believed that the gum has better binding quality when handled this way.

"Further commercial experience showed that it is preferable to add from one-fourth to one-half per cent, based on the clay, of 26 deg. Bé. ammonia to the water in which the clay is stirred, as this makes an improvement in the final coating mixture, in addition to helping to smooth down the clay. When the hot gum solution is added the pH of the resulting coating mixture is approximately 10.

"Operating on the above basis, the formula for commercial runs would be as follows:

Clay slip	Gum
100 pounds clay.	18 pounds gum.
75 pounds water.	72 pounds water.
One-fourth to one-half pound 26 deg. Bé. ammonia.	2 to 3 ounces 26 deg. Bé. ammonia.

"Coating gums B and C have been successfully used commercially in coating also with mixtures of clay and satin white. Due to the fine state of subdivision of satin white and to its somewhat alkaline reaction a larger percentage of gum C should probably be used, depending upon the amount of satin white admixed with the clay. Unlike the procedure with casein as the adhesive, the clay satin-white slip should be at a fairly high temperature when the coating gum is added, as this provides the lower viscosity and a better spreading mixture.

"A typical formula for work with satin-white mixtures is as follows:

Clay satin-white slip	Gum
75 to 100 pounds water.	228 pounds water.
100 pounds clay.	One-fourth pound ammonia (26 deg. Bé.).
200 pounds satin white.	57 pounds coating gum.

Stir the clay satin-white mixture for two hours or until perfectly smooth and then add the solution of coating gum. To prepare the gum solution stir cold until gum is dispersed evenly, then apply heat by direct steam until 190 deg. to 195 deg. F. is reached, maintaining this or a slightly higher temperature for a sufficiently long period to produce a clear amber-colored solution. Cool the gum solution to 140 deg. to 160 deg. F. and add to the clay satin-white slip, stirring continually meanwhile. Then adjust the coating mixture to the necessary concentration and fluidity for application on the coating machine."

coating mixtures are prepared by the usual procedure.

2. Graded as to their clay-suspending property, the adhesives used are in the following descending order—starch, casein, and glue. Graded as to the suitability of the coatings for ink writing the apparent order is casein, glue, and starch.

3. Starch coating mixtures are not as free-flowing as mixtures in which casein or glue is used as the adhesive, but the starch mixtures used in the tests spread and brushed out satisfactorily.

4. It is doubtful whether modified starch has quite as strong adhesive quality as casein or glue, but all sheets of the foregoing tests containing 18 parts of starch per 100 parts of clay were entirely satisfactory in this respect, judged by either the sealing wax pick test or the printing experiments. Results reported for subsequent commercial tests were in agreement with those obtained at the bureau.[10]

[9] Reports on a variety of commercial printing tests indicate, however, that "the gum-bound coating does not readily leach off, and this feature seems to explain its adaptability to most lithographic work."

[10] Commercial printing tests on the commercially coated papers (footnote 8) were reported as satisfactory even for the papers for which 15 per cent of gum had been used, "even for multicolor work using tacky inks, including the tackiest solid black."

5. The surface of starch-bound coated papers appears to be more absorbent than that of papers for which glue or casein is used as adhesive for the mineral, and consequently ink may penetrate it to a greater extent. For this reason it might be expected that printings on the starch-bound coatings would tend to be blurred unless special care was used in the operation, but this tendency was not apparent in the printing tests on the experimental papers.

The manufacturer of some coated papers may wish to use casein in order to give his paper good printing quality regardless of whether the paper is dampened. A high degree of water resistance is not required for a large majority of printing papers, such as book, magazine, and catalogue, however, and starch-coated papers could apparently be used for these very satisfactorily.

6. Notwithstanding its lack of water resistance, modified starch has a number of attractive qualities. It is clean, does not have an unpleasant odor, and is cheap. When comparing the price of casein with that for glue or starch, the cost of solvents for the casein must also be taken into consideration, although in the case of starch, the greater percentage required reduces the cost differential somewhat.

Classes Of Color Used In The Dyeing Of Paper *

By Harold E. Pratt [1]

The colors used in the dyeing of paper are divided into four classes: basic, acid, direct and pigment colors.

Basic colors are probably the most important colors used in the coloring of paper because of their great brilliancy. They have two disadvantages, however. In the first place they fade quickly and for this reason are but little used in high grades of paper. They are, however, used to a small extent in high grade papers to top off acid or direct colors to improve the brilliancy of the shade. Secondly, basic dyes have a tendency to cause a mottled effect on a paper consisting of mixed fibers such as groundwood and sulphite. The colors have a greater affinity for sulphite fibers than for groundwood and consequently they color the sulphite fibers deeper.

Mottling can be overcome to a large extent by adding the dye to the beater in a very dilute form after some of the groundwood is furnished and before the sulphite pulp is added. After the color is mixed well the beater can be thickened with the remainder of the groundwood and the addition of the sulphite. Another way commonly used is to furnish some of the size and alum to the beater before the color is added. This tends to coat over the fibers, consequently reducing the affinity for sulphite fibers.

All basic colors can be dissolved together, but they should not be dissolved with acid or direct colors; for by so doing a precipitation of color lakes will be formed which will show color spots in the finished paper.

Acid colors have a fair amount of brilliancy and do not mottle to any great extent. Consequently, they make good colors to use on papers consisting of sulphite and groundwood. It is necessary to use size and alum with acid colors to set the color on the fibers. A large excess of alum should be avoided as it will tend to deaden the shade. When acid colors are used a brighter shade can be produced by first coloring with acid colors and then topping off with basic colors. The color lake produced from the precipitate of acid and basic colors makes a fuller dyeing than can be produced with only acid colors and in some cases is somewhat less expensive than trying to produce a desired brilliancy with acid colors alone. If care is taken not to use too much basic dye in topping off the acid color, a brilliant shade will be obtained which is fairly fast to light. Acid colors will stand considerable heat, that is, the water they are dissolved in can be used nearly at its boiling point.

It has been my experience that acid colors can be added to the beater in the dry form without any appreciable decrease in strength of shade.

Acid colors, as a rule, are not as sensitive to hard water as are basic colors. However, nigrosine has a poor fastness to alkali.

Direct colors are salts of color acids and it is not necessary to use size and alum to set the color. Direct colors are less brilliant than acid or basic colors, but the direct colors that are used in the paper industry are as a rule more fast to light.

Direct colors are sensitive to hard water and if much alum is used in setting the size, it will also deaden the shade. The best results with direct colors are obtained by heating the stock to 140 deg. F., and adding common salt to bring out the color more fully. Soda ash can also be used to good advantage in bringing out the brilliancy of direct colors where it is not detrimental to sizing. Direct colors are best used on slack sized or absorbent papers. When direct dyes are used the return waters from the paper machine show very little color in them.

Pigments used in coloring paper are divided into two classes; colored insoluble inorganic compounds, and insoluble organic compounds which are aniline dyestuffs.

The coloring with pigments depends mostly on the mechanical method of beating the pigments into the pulp. The depth of the shade depends largely on the amount of beating and the degree of sizing. The character of the stock also regulates the depth of the shade. A slow stock will retain more of the color pigments than a free stock, also the amount of suction used on the paper machine affects the depth of the shade and the amount of two-sideness. When pigments are used on deep shades they possess about the same effect on the finished paper as clay and other loading materials. The principal advantage of using pigments for coloring purposes is their extreme fastness to light. The earth pigments, such as sap brown, turkey umber, and ochre should be tested for grit. If grit is present in any appreciable quantity, it will cause pin holes in the paper and have an abrasive action on felts and wires, thus shortening the life of the clothing. The colors to be used in a certain paper are covered by the specifications of that paper; such as fastness to light and alkali, or according to the purpose for which the paper is to be used.

* Presented at the annual meeting of the Technical Association of the Pulp and Paper Industry, New York, N. Y., Feb. 17-19, 1931.
Contribution of the Preparation of Non-Fibrous Materials Committee.

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What Patents Mean to the Paper Technologist*

By Joseph Rossman[1]

There are few legal documents that are so respected and awe-inspiring as letters-patent or as popularly designated, a patent. The original patent itself is rather impressive in appearance, decorated with a large red official seal, blue ribbons, and an engraving of the Patent Office building as it appeared fifty years ago. Upon looking closer you will see the title of the invention and a grant to the inventor, his heirs and assigns, for the term of seventeen years, for the "exclusive right to make, use, and vend the said invention or discovery throughout the United States and the Territories thereof." These words are enough to make any neophyte inventor exaggerate the importance of his invention and to cause him to demand a million for his invention, but as I will point out later this is mere legal phraseology full of many "ifs" and "buts" to the inventor.

Nature of Patents

A patent is primarily the written and legal memorandum of a bargain closed between the government and the inventor. It is a contract whereby the inventor agrees to disclose every essential detail of his invention to the public in return for a seventeen year monopoly of his invention. At the end of this period the inventor's rights terminate automatically and the public is entitled to the free use of the invention without further hindrance from anyone. You may wonder why the government should want to enter into this contract at all with a humble inventor. I may say briefly that it is primarily motivated with a desire to educate the public and to encourage the progress of the useful arts and sciences as stated in the Federal Constitution. In order to induce the inventor to divulge his invention to the public, the government offers to reward him with a patent, if he complies with all the statutory regulations.

In carrying out its educational program, copies of all granted patents are published by the government and sold by the Patent Office at ten cents a copy to anyone who desires them. About 1,800,000 patents are now available.

Patent Office Classification

Incidentally our government carries on an immense 10 cent business by the sale of printed copies of patents. Last fiscal year 7,153,000 copies of patents were disposed of. In this form a patent is often an interesting and valuable publication to the paper technologist for the information it contains. Sometimes no other information on a problem is available except what is found in the patent literature. No paper technologist can very well afford to overlook this veritable mine of technical information. In order to know where to search, the paper technologist must understand the peculiar patent classification system of the Patent Office. There is a class, for instance, designated paper making which contains patents relating to the manufacture of paper, but many pertinent patents will be found scattered in other classes which are equally important to the paper technologist. Patents for waterproof paper, for example, may be found in a half-a-dozen classes and there is no method of finding them except by intimate knowledge and experience with the Patent Office classification.

Patents Issued

Over 4500 patents have been granted in the official class of paper making since 1836. The following table gives a summary of patents granted for paper making down to November, 1930, based on the official classification:

PATENTS FOR PAPER MAKING GRANTED FROM 1836-1930

Chemical processes (total)		1411
Acid	266	
Alkaline	404	
Sizing and fillers	211	
Miscellaneous	530	
Apparatus (total)		3112
Beaters	317	
Refiners	202	
Screens	366	
Cylinder machines	222	
Fourdrinier	234	
Suction boxes	158	
Feed regulators	98	
Couch rolls	61	
Dandy rolls	90	
Calenders	202	
Miscellaneous	1162	
Total		4523

As might be expected the number of patents for paper making machines is more than twice the number granted for chemical processes. Many interesting comparisons may be obtained by studying this table.

Patent Holders Rights

Returning to the legal aspect of a patent I have already stated that it gives the inventor the "exclusive right" to his invention. Few of our paper technologists, who received about 550 patents last year, know that this exclusive right is not what it apparently means. The exclusive right to a patent means that the inventor has a right to go into a federal court of equity and ask it to prevent others from infringing his patent, in other words, to exclude others from using or selling his invention. The government gives the inventor nothing which he did not have before except the right to fight others in court if he has the money. It does not guarantee anything when it grants a patent. A patent may in one sense be considered as a permit for its owner to spend his own money in getting after infringers and to bring them into court to stop them. The government will do nothing whatever on its own initiative, even though the inventor has a revolutionary invention of which he is being robbed outrageously. As one inventor has said, "If an inventor happens to develop something worth while and gets a patent, he is simply getting a ticket for the most exciting joy ride anyone can get in this country."

Few individual inventors of basic inventions have directly profited from their patents. If their invention is valuable they soon find themselves pirated by infringers and the only redress obtainable is by expensive court litigation. About $1,000,000 was spent in fighting the infringement of Edison's incandescent lamp. Edison, himself, has recently said that he spent more money in obtaining, litigating and preventing infringements of his patents than he received from them as such. Dr. Reginald Fessenden, who has made many important radio inventions, also states that he has not made a penny from his patents. In spite of the experience of these outstanding inventors I believe that patents have a decided value to the paper industry as I will indicate later.

Another thing which few paper technologists know is that a patent seldom covers everything it shows. The government should print across it in large red letters, "Subject to prior rights." Every new patent issued is subject to limitation in scope and protection by the prior work done by others along the same lines. The patent may be even invalid because a pertinent reference was by chance not known to the Patent Office at the time of its issuance. But what is still worse, where the patent is apparently a good one, the inventor may be sued for infringing previously issued patents, because the Patent Office issues a patent on the basis of novelty only and it does not look into the possibility of infringement of other outstanding patents. This is particularly true of improvement patents where some changes or additions are made on existing methods or machinery. If patents happen to be

* Presented at the annual meeting of the Technical Association of the Pulp and Paper Industry, New York, N. Y., Feb. 17-19, 1931.
Contribution of the Patents Committee.

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in force with dominating claims for a new method or apparatus, then all subsequent inventors who improve the invention are ordinarily subject to the payment of royalties or exclusion altogether to the use of their own improvements, no matter how valuable and useful they may be.

Patent Claims

These matters are difficult to understand without having a clear understanding of the "claims" of a patent. Every patent contains a specification which is a detailed written description of the invention, addressed to the workers in the industry to which it applies. Minute details or working dimensions of machinery are practically never given. The specification merely gives the essential details so that the trained paper technologist could readily reproduce the results described.

At the end of the specification is attached a series of little numbered paragraphs which are designated as "claims" which legally are the very heart of the patent, for they are supposed to indicate how the patent differs from all others. These claims are couched in complicated and apparently verbose phraseology which reads like Greek to everyone except the patent experts. These claims often appear to be repetitions or variations of each other but I can state here that no paper technologist can afford for a moment to overlook or neglect them. They are legal word-pictures of his invention. A patent stands or falls on its claims, for a claim defines that which is secured to the inventor and it gives public warning just what is forbidden to make or use without the inventor's permission. The claims are thus the measure of the strength and value of a patent. All patent suits are bought entirely on the basis of the claims. Patents are granted because the claims have been skilfully drafted by trained patent attorneys. The drafting of claims is a fine art in itself, often requiring the adroitness of a metaphysician and the linguistic skill of a medieval scholastic. It requires versatility, a thorough knowledge of patent law and court decisions, and much experience.

I cannot impress too much upon the paper technologist the importance of the claims in his patent. The function of a claim is to define in clear, distinct and unambiguous words the novelty of his invention over what has been done before, or the "prior art," as it is called by the Patent Office and courts. About a hundred years ago the inventor merely had to describe his invention and perhaps illustrate it with drawings and then merely "claim the inventor as substantially described." The law today, however, requires that the inventor "shall particularly point out and distinctly claim the part, improvement, or combination which he claims as his invention." This may seem to be a simple thing to do, but practically it is an extremely difficult task.

Claims are often allowed by the Patent Office on account of the use of certain words, phrases or clauses in the claim, although everything else in it is old. It is sometimes very difficult to tell by mere inspection just why certain claims were allowed because they seem to read directly on what is old. A close study of the original patent file which contains all the papers, arguments and correspondence of both the patent attorney and Patent Office may shed some light on the claims. The paper industry is so well established and developed that usually only small improvements are possible today. For this reason the claims may differ from the previous developments by mere clauses or words and it is only in those that the real novelty of the invention resides.

A patent rarely covers everything it describes or shows. Many paper technologists unfamiliar with patents are sometimes amazed and astonished upon reading a brand new patent because it contains so much old stuff, and they erroneously think that the patent covers everything it shows. As previously stated, the patent only covers what is defined in the claims and very often the validity of the claims depends on just a phrase or a word.

A prominent attorney has said: "In the present approved type of claim the object seems to be to set forth as many features or elements which are old and known, as possible, and hide inside the claim, so to speak, the invented feature that is new and intended to be covered by the patent. Direct statement of the meat of the invention seems the last thing a patent claim of the general combination type presents."

Under our present practice, claims should be drafted to cover not only the specific form of an invention but also its broad form so that equivalent inventions having analogous mechanical elements, steps in a process, or ingredients in a composition, will be embraced within its terms. At the same time the claims must be so drawn as to avoid the prior art. Claims thus draw a fence around the novel features of an invention in order to keep others out and the more area the fence includes the better the claims are, but if the fence should include some one else's or public property, then it is invalid. The best type of claim should state the essential and primary attributes of the invention, and not those which are accidental, immaterial, irrelevant or unessential.

Sulphate Process Patent

Claim drafting is analogous to solving a problem in geometry. What is known is given in the specification and in the prior art, so far as it is available. The claims must then be constructed, observing all the rules and decisions of Patent Office practice, as well as court decisions. Possible equivalents, infringements and attacks on validity must be reckoned with.

The matter of claims may be made more clear by the following concrete example. In 1871 Eaton obtained a basic patent 119,224 for the sulphate process having this claim:

"The use of the sulphide of sodium as a solvent in the treatment of wood, straw, or other vegetable fiber."

In 1884, Dahl obtained another patent, No. 296,935, for an improvement of this process. His claim read as follows:

"The process of producing cellulose from wood or other vegetable matters by boiling the same under pressure in a watery or hydrated solution containing sulphate of soda, carbonate of soda, soda hydrate, and sodium sulphide."

Now, although Dahl had a patent for his process, Eaton could prevent him from using it because in using the improved sulphate process the claim of Eaton would be infringed in that sodium sulphide was used. In this situation Dahl would have to obtain a license from Eaton for the term of the latter's patent in order to be able to use his own process. At the same time Eaton could not use Dahl's process without infringing Dahl's claim, so that he too would have to get a license if he wished to use the improved process.

It may be interesting to note here why Dahl was granted a patent. An inspection of his claim shows that although it calls for the use of sodium sulphide, already patented by Eaton, he uses the additional reagents of sodium sulphate, carbonate and hydrate. The claim also states that the wood is cooked under pressure. Dahl obtained his patent because in the opinion of the Patent Office this required invention and was not obvious, although Eaton disclosed the basic idea of using sodium sulphide.

Broad Claims

Patent attorneys are forever attempting to get broad claims for their clients. A broad claim is one which employs comprehensive and all-inclusive language in defining the invention so that all infringers who may attempt to avoid the specific form of the invention will nevertheless be caught by the broad language of the claims and thus be liable for damages. For this reason patent attorneys dislike to call a spade a spade, or other mechanical devices by their real names in drafting broad claims. The elements of an invention are accordingly often designated as "means" to do something, such as "means" for grinding wood, "means" for treating chips, or "means" for removing water by suction. All obvious mechanical variations and substitutes are thus included by such language. If your attorney should fail to draw broad claims for your invention even though you are entitled to them, especially if it were a revolutionary or basic invention worth millions, the Patent Office will ordinarily not tell you to do so in order to protect your interests. This is probably due to the reason that a patent in the nature of a bargain between the inventor and the

public and so it is up to the parties to drive their own bargain and terms. The Patent Office, however, acts to protect the public and it will, therefore, reject claims which are too broad or unwarranted, for they will give the inventor more than he is entitled to. It is thus important for the paper technologist to see that he obtains all the claims to which he is entitled. His attorney should draft the claims so that they embrace the essence of his invention, and its distinguishng characteristics both specifically and broadly. The vital and leading feature, the very soul and essence of the invention must be expressed in the claims. There should also be a sufficient number of claims drafted to include all the novel points of the invention. The Patent Office never objects to a reasonable number of claims when the invention warrants it.

Claims should not contain a complete description of the invention. Such claims are the worst possible to have in a patent because they can be easily evaded. Many inventors think they have a good patent because their claims are very detailed and specific. The best claims, on the contrary, are usually the shortest, and most comprehensive in language.

Value of Patents

Patents, in general, have a real value to the paper technologist and manufacturer, just as in all other industries. Otherwise, we would not witness the issuance of 50,000 patents each year. Patents for practical and desirable improvements have an actual cash value, measured by the present and potential demand for them. As paper technologists, you are no doubt familiar with many examples of such patents.

Patents are also a very convenient and legal means for building up a monopoly in a particular industry or portion of an industry. As far as I know, there are no very large patent monopolies existing in the paper industry, probably because it is old and well established so that the primary basic inventions are freely used by all. In some industries, however, vast patent monopolies have been built by a method which consists in obtaining all possible patents for technical improvements. Research workers are engaged to develop inventions. Patents obtained by outsiders are also brought up whenever possible. These ultimately build up a solid wall of patents around an industry so that no stranger can enter the domain without infringing some patent, and he must either get out, give up his enterprise or enter stipulated conditions and agreements with the patent owners.

Sometimes a patent has a very useful function due to its advertising power. Goods and machinery are often sold because they are "patented." There is some indefinable magic in this word to the buyer. Many believe that the government has officially approved and passed on the practicability of the invention. The truth of the matter is that the government does nothing of the kind. Only in unusual cases are practical tests of an invention demanded by the Patent Office. The grant of a patent does not necessarily mean that it is practical, useful, desirable or feasible for the industry.

Scaring Away Competitors

As indicated before, patents are not necessarily obtained for making direct profits. They are often very effective in scaring away competitors. All patents are prima facie valid in the eyes of the law until proved otherwise. Thus a patent, even if by chance invalid, is an effective stick to shake at a competitor. The Patent Office, of course, makes all efforts to issue valid patents.

Patents also have an insurance value for the paper manufacturer who obtains patents not so much that he cares a fig about them for making profits but merely to insure himself so that the other fellow will not get a patent and thus prevent him from carrying on his new developments. This is an unfortunate situation in our patent system. According to the law, any invention in public use for more than two years cannot be patented but the Patent Office has no direct facilities for investigating possible public use in each patent application and it, therefore, rarely rejects applications on the ground of public use. The manufacturer, in order to tide over the dangerous first two years of an invention should, therefore, obtain a patent for any important improvement which he has developed, in order to protect himself. Otherwise an unscrupulous competitor may obtain a patent for it although he did not invent it himself. An infringement suit may be thus filed against an innocent but honest manufacturer for infringing his own invention merely because he failed to get a patent for what he had developed.

Promote Progress

Patents have been valuable in promoting the progress of the paper industry, through the publication of the latest achievements. It is no longer necessary to keep new developments in secret for they can be protected through patents and, therefore, they can be safely discussed before paper technologists so that in the long run the development of the industry is advanced. If it were not for patents many important findings would be kept secret so that other workers could not be stimulated to further research. This state of affairs would ultimately become a hindrance to industrial progress. A research director of a large corporation has said:

"Patent protection is vital to the proper development and continuance of industrial research. Without patent protection it would be impossible to obtain large appropriations for conducting the more expensive and long-continued types of industrial research. We conduct much research without thought of patent protection, and by publishing the results, contribute to the general advancement of industry. However, the cost of such research is often borne (or the expenditure made possible) by the financial returns from patented inventions."

Incentives to Development

Patent protection is without doubt one of the greatest incentives in the development of an industry. Many companies would not be justified in spending as much as they do at present on their engineering departments in the absence of patents. As Dr. William M. Grosvenor has said:

"Unless there is security in intellectual property no group of business men and investors is warranted in building an industrial and business structure thereon. They would be foolish to undertake the effort and expense of introducing the invention and educating the users. Why? Because any fly-by-night imitator, without the handicap of interest and amortization charges on the initial and development expenses, can make a profit at the actual cost of the pioneer and can drive him out of the business he has risked the time and money to build up."

Heat Reclamation

At the new central steam plant of Crocker, Burbank & Co., Fitchburg, Mass., one of the newer pulverized coal burning plants serving the paper making industry, commodious fuel economizers are employed, but no air preheaters. The hot air supply for the pulverized fuel system being a by-product of the air cooled refractory furnace floor. The boiler units, three 500-horsepower steam generators, operate at a normal rating of 300 per cent, furnishing steam to the turbines at 385 pounds pressure and 175 degrees superheat. Regular daily operation under these conditions has shown an overall efficiency of better than 84 per cent.

This high ranking of the steam generators is attributable in large part to the effective heat reclamation by the 2,500 square feet of economizer surface with which each boiler is provided. These economizers are of the high pressure, counterflow type and absorb some 10 per cent of the heat utilized in the system, a result made possible by the extended surface construction of the economizer elements and the complete counter-current flow of gas and water arrangement. The economizer elements are divided into banks for the accommodation of soot blower elements between the banks. To save height in the boiler room, the economizers have been installed on their sides, which, while of no particular benefit so far as heat reclamation is concerned, is of interest as evidence of the marked adaptability of the units in meeting local conditions, or requirements.

Section of the

COST DEPARTMENT

of the

American Paper and Pulp Association

Edited by T. J. Burke C. A. Director Cost Dept.

Keeping Equipment Modernized

In a splendid address delivered recently over radio, Dr. Julius Klein, the Assistant Secretary of Commerce, dealt at some length on the development of improved machinery in our various industries and placed particular emphasis on its beneficial effect on the workers of the country. His talk quite strongly refuted the many claims that have been made at times to the effect that the influx of labor saving machinery has decreased the possibilities of employment for many of our workers. He went on to show how, through the use of improved machinery, production has been increased and, likewise, new jobs have been created for additional workers.

Using the automobile industry as an illustration, Dr. Klein showed how, through the use of improved machinery the production of automobiles has been greatly increased, and with this increasing production millions of jobs have been created for workers in connection with the making and selling of parts and accessories, for tire workers, workers in metals, in lumber and wood, in textiles, glass, and other raw materials. And the same situation applies in numerous other lines that have been brought into being through the great development of improved machinery.

The significant part of Dr. Klein's address—that is, the part to which we wish to give emphasis here—came in the following paragraphs.

"American workers earn more, and live better, because the machines available to their hands produce more. In this we have the secret of one of the vital sources from which flow the high American standards of material existence, and the democracy of American culture.

"Through the use of constantly improved machinery the path to progress lies. Our welfare required continuing the rapid improvement in production methods, for it is in this way that we have attained, and will be able to maintain, the industrial leadership of the world—with all that means to us in every aspect of our life.

"Please note that word MAINTAIN—for here we run upon a truly surprising situation, a fact that is very apt to 'hit us in the face.' Many of us are too prone to think that practically all American machinery is the 'last word' in efficiency and perfection of performance. But the facts do not bear that out.

"Instead of being uniformly in the vanguard, many of our factories are actually falling behind the procession—failing to keep step as they should with the progress of inventive genius and engineering achievement. No good can come of that."

Dr. Klein then went on to tell how it has often been said that Andrew Carnegie won his position of leadership in large degree because he was always ready to replace a machine, or a complete steel plant, as soon as better equipment became available, and he did not care whether the machinery he discarded was ten years old or ten weeks. "He recognized," said Dr. Klein, "with the deep, shrewd penetration of genius, that old machinery will not do—that our indispensable strength lies in using the very best equipment that can be obtained."

Referring to the marvelous progress machinery designers have made in the development of their designs in recent years, and stating that in the year 1930 alone machine-tool builders announced over 1,000 improvements, Dr. Klein said "and these improvements are so outstanding that many a machine becomes too expensive to operate long before it is worn out."

Commenting on Dr. Klein's address on the day following, the Washington, D. C., *Evening Star* carried an interview with Kenneth H. Condit, the editor of the *American Machinist,* in which it was said that this radio address on the general subject of out-of-date equipment would "serve to focus public attention on opportunities for reduction of manufacturing costs and elimination of waste which exist in industry at the present time."

Mr. Condit summarized an industrial equipment survey just completed by his publication, the *American Machinist,* in which he stated that "48 per cent of the 1,400,000 machine tools in use in our metal working plants today date back to the war or pre-war period and have been outmoded by advanced designs."

In pointing out the percentages of old machine tools in plants making other metal products, Mr. Condit referred to different lines, and included "paper and printing machinery 47 per cent." We take it that this reference is not to the paper and printing machinery itself, but to the machinery used in making it. It would be interesting, if possible, to know just what a survey of the machinery for the production of pulp and paper would show.

The article in the *Washington Star* closed with the following paragraph:

"Modernization of industrial equipment", said Mr. Condit, "benefits both the manufacturer and the ultimate consumer, since it reduces production costs and enables the finished product, whether it be motor car or electric refrigerator or other product needed by the consumer, to be delivered to him at great savings in cost. Modernization of equipment stimulates business through greater economies and more intensive marketing opportunities and reduces unemployment. Through the elimination of obsolete equipment units in industry waste is eliminated, with resultant gain to the manufacturer and the buyer."

Going back to the radio address of the Assistant Secretary of Commerce, Dr. Klein referred to this survey made by the *American Machinist* and said that "Although this survey has to do only with equipment in metal working plants, there is reason to believe that a parallel situation exists in other factories producing other types of commodities". He continued:

"This brings most of us up with a start, and there is cause here for concern. There is surely no justification for retaining in American factories machinery, which is undeniably antiquated, which does not do its job properly, which works slowly or clumsily in comparison with newer types.

"That can mean nothing but hampering, cluttering waste. It impedes the smooth flow of progress. It tends to throttle competitive ability. The resulting losses and disadvantages are much more likely to react upon American labor as a whole than would the introduction of new equipment of the more modern and effective types. Economical production will work to the advantage of every class and element in our economic life.

While most of the references made by Dr. Klein and also by Mr. Condit are not specifically directed to the equipment in any particular industry of the country, they do unquestionably have an application. Does it not give us cause to think deeply and constructively about the condition of the equipment we are using in our plants? Is there not plenty of opportunity for some investigation to determine whether the equipment we are using is of a character that enables us to keep pace with the changing trend of economic conditions?

Using obsolete or run down equipment is costly. It does not permit of keeping up with modern progress, nor does it enable the user to cope with competitive conditions. While it requires some degree of courage to scrap a machine that has been in use for some time, one that to all intents and purposes is still giving fairly satisfactory service, yet the great advantage of having more modern and efficient equipment should tend toward bolstering up the courage to replace the old machine.

One illustration used by Dr. Klein in his address shows what might be an extreme case, yet it is not without its significance. "Take just one of numerous cases that have come recently to my attention", he said. "Six machines were ordered for a certain operation in manufacture. Before they were delivered a better design had been developed. These machines were actually obsolete before they could be put to work. What did the management do? Was it penny-wise and pound-foolish? Did it try to make shift for a while with the inferior equipment? No—this firm had both courage and true wisdom; it paid the bill, quietly scrapped the six machines, and replaced them with the better types."

The question of replacing old equipment as soon as it becomes obsolete can not be discussed without leading into one highly important phase, and that is the necessity of setting up the proper reserves for depreciation, or for obsolescence. When this is done properly, the necessary funds are available when the time comes for replacing worn out equipment. No cost figures are true cost figures unless they include the proper allowance for building up a reserve with which to take care of this vitally important element of obsolescence.

Court Recommends Uniformity in Accounting

In an opinion rendered in a suit for injunction against the proposed Bethlehem-Youngstown merger, the judge of the Mahoning county (Ohio) common-pleas court digressed from his analysis of the case to comment on the desirability of uniformity in accounting practices. Following is the excerpt from the court's opinion bearing on this question:—

"Some phases of the attempted adjustments for comparability of the two corporations, included in the accountants' ratios, were related to physical properties, manufacturing processes and actual problems, obviously outside of the determination of the most skilled accountant. Others were of important items for charging, for which there is no hard-and-fast accounting made.

"I have been impressed in this case, as to both companies, with the divergence of accounting practices and the arbitrary technical treatment of accounting items. These have resulted here in much difficulty of understanding and in use of time, and made what should be comparatively simple valuation of two similar projects, a complex mathematical problem of incommensurable quantities.

"From this I deduce that action should be taken by cognate industries voluntarily and not by legislative compulsion, with the cooperation of the accounting profession to make uniform, as far as possible, their accounting processes, for purposes of setting up uniform standards of comparison of accounts, earning and values for the guidance and necessary knowledge of directors and shareholders, as well as of the investors generally.

"I am further of the opinion that directors, shareholders and incidentally the courts, should have a clear, explicit explanation of the accounting facts relating to a corporation in form and language, which in accordance with common sense will enable the ordinary reader, without hiring a technical interpreter, to determine the actual state of the company's business, prospects and value. Corporate statements and reports are for the information of the layman, not of skilled accountants. Such a purpose being so fulfilled, a repetition of the months spent in this case, with the use of language and schedules that not even skilled executives in the corporations involved could understand, would be done away with."

* American Institute of Accounts Bulletin

Full Time Work for B. C. Plants

Lawrence Killam, president of the British Columbia Pulp and Paper Company, states that despite the difficult conditions confronting the pulp and paper industry the two mills of the company at Port Alice and Woodfibre have been running practically full time.

"It is hoped that the widespread sales which have been made in small amounts recently in Europe will lead to an increased demand which will stabilize operating conditions," said Mr. Killam.

A development of special importance is now in progress at the Port Alice plant of the British Columbia Pulp and Paper Company, where a barking and chipping plant is being installed which is expected to reduce the consumption of logs by about 20 per cent. The new equipment, which will be the largest of its kind in the world, will enable the logs to be cleaned of bark with the least possible wastage. It will be capable of handling logs ten feet long with diameter up to 22 inches. The barked wood will be conveyed direct to the chipper inside the mill, the logs being left intact without being split. Splitting equipment is being installed to handle logs of 24 inches in diameter. At first it was planned to spend $100,000 on the new equipment but latest estimates of the cost of the completed installation total $175,000. It was thought wise to add some additional equipment in the matter of cleaning and handling of chips so the new installation will parallel the present sawmill and chipping plant without interfering with the operation of the oirginal layout whenever it is found advisable to use it.

The barker has been built in Canada, heavy forgings being brought from Eastern Canada, while the body of the barker was made in the shop of the Dominion Bridge Company at Vancouver. The body was erected by the Dominion Bridge Company at Port Alice. The erection of conveying equipment is expected to be completed about the middle of February when the first trial operations will take place.

Awards Granted Injured Mill Workers

CANTON, N. Y., March 31, 1931.—Injured paper mill workers were benefitted at a session of Compensation Court held here and presided over by Judge James Richardson. The case of Claude Brayton, an employee of the International Paper Company, was continued for further medical examination. He was recently awarded $590 for the loss of an eye but he now claims further compensation. Theffley Rose, an employee of the Racquette River Paper Company, sought further consideration for injuries but the case was ordered closed on payments already made. Among the largest awards granted was one of $5,930 to Harold Shannon, who suffered injuries several years ago at the Pyrites mill of the De Grasse Paper Company. The case has been contested on several occasions. An award of $2,500 has already been granted to the widow and children of the late George Hennegan, until his death an employee of the Racquette River Paper Company. In November, 1928, he was injured while performing his duties and the compensation was ordered to be paid in installments for 265 weeks.

CONSTRUCTION NEWS

A Summary of Vital Facts Regarding Construction, Finances and Operation of Paper Mills

Construction News

Richmond, Va.—The American Paper Bag Company, 602 North Seventh street, has acquired the building formerly occupied by the Republic Paper Products Corporation in the Highland Park section, and will occupy for a new plant for the manufacture of kraft paper bags, including flats, self-opening units and other containers. It is expected to have the plant equipped for extensive production at an early date.

Buffalo, N. Y.—The Niagara Corrugated Container Company, Inc., recently organized by R. O. Gruber, 337 North Drive, Buffalo, and associates, with capital of $50,000, is said to be arranging early operation of a local plant for the manufacture of paper bags and containers, including paper board and fiber products. A. R. Habinghurst, 7275 Wentworth avenue, Cleveland, Ohio, is interested in new organization.

Seattle, Wash.—The Bates Valve Bag Company, Pacific Northwest Building, will proceed with the erection of a new one-story plant unit on West Spokane street, totaling about 22,500 square feet of floor space, reported to cost close to $75,000, with machinery. Company is a subsidiary of the St. Regis Paper Company, New York, N. Y.

Appleton, Wis.—The Institute of Paper Chemistry, Lawrence College, South Union street, has taken bids on general contract for a new paper chemistry building at the institution, 50 x 114 feet, with two wing extensions, 80 feet and 63 feet long, respectively. The structure is estimated to cost close to $100,000, with equipment. It is expected to award building contract at an early date. Orbison & Orbison, 110 West College avenue, Appleton, are engineers, in charge.

New Haven, Conn.—The New Haven Paper Box Company, 214 East street, recently chartered under state laws to operate a local plant, has been organized with Benjamin Ledewitz as president, and Irving Levine as vice-president; Ned Hoffman is secretary and Harry Oppenheim is treasurer.

Pittsburgh, Pa.—The D. J. Rex Box Company, Boyd and Locust streets, manufacturer of paper boxes and containers, is said to have plans in progress for proposed rebuilding of portion of plant recently destroyed by fire with loss reported at close to $75,000, including equipment.

Wisconsin Rapids, Wis.—The Consolidated Water Power and Paper Company, Wisconsin Rapids, has submitted plans to the State for approval, covering rebuilding of its power dam at Biron, across the Wisconsin River at that point. It is understood that work may be placed under way during the summer. Estimated cost has not been announced.

Peoria, Ill.—The Murison Label Company, manufacturer of labels, tags, etc., has completed plans for a new local plant, consisting of one-story structure, with boiler house adjoining, to cost over $100,000, with equipment. General contract has been let to the W. M. Allen Son Company, Jefferson Building, Peoria, and superstructure will be placed under way at once. R. I. Bentley is vice-president, in charge.

Green Bay, Wis.—The Northern Paper Mills, Day street, are understood to have work nearing completion on a new two-story plant unit for the chemical division, 32 x 106 feet, to cost over $70,000, with equipment, and will have the structure ready for service at an early date. H. W. Gochnauer is plant engineer, in charge.

Augusta, Me.—The Cushnoc Paper Corporation, Augusta, has been advancing production schedule and is showing a large increase in output as compared with this month a year ago.

Huntington, W. Va.—The Midwest Box Company, 111 West Washington street, Chicago, is planning early occupancy of its new plant unit now in course of construction at the glass-manufacturing plant of the Owens-Illinois Glass Company, Huntington, to be equipped for the manufacture of corrugated paper containers for glass products. It will have a capacity of about 50,000 boxes per day, and is reported to cost in excess of $80,000, with equipment.

Chicago, Ill.—The Whiting Paper Company has leased space on one of the floors of the Butler Brothers Building, 247 West Randolph street, totaling about 24,000 square feet of floor area, and will occupy for local headquarters, removing from 318 West Washington street.

Ridgefield Park, N. J.—The Continental Paper Company, River Road, Bogota, N. J., is said to have asked bids on general contract for a new mill at Ridgefield Park, consisting of a two-story unit, reported to cost close to $50,000, with equipment. It is proposed to place superstructure in progress at an early date. Johnson & Wierk, Grand Central Terminal, New York, are architects, in charge.

Tuscaloosa, Ala.—The Gulf States Paper Corporation, Tuscaloosa, has completed the consolidation of plants at New Orleans and Braithwaite, La., with plant at Tuscaloosa, where production will be concentrated in the future. Increased capacity is available at the plant as soon as required. W. E. Penfield is vice-president in charge of production.

Beaupre, Quebec.—The Ste. Anne Paper Company, Ltd., is said to be arranging for the early discontinuance of production at local news print mill, which has a rated capacity of about 275 tons daily. The plant has been giving employment to more than 350 operatives. The company is an interest of the Abitibi Power & Paper Co., Montreal, Que.

St. John, Newfoundland.—The Reid-Newfoundland Company and affiliated organizations, operating paper mill units, have been placed in receivership. Allan S. Butlerm, a large bond holder, has been appointed manager at the plant. It is proposed to continue production at the mill until further notice. The company has extensive timber holdings in Newfoundland and Labrador, suitable for pulp wood supply.

Stockholm, Sweden.—The Svenska Cellulosa, A.B., a subsidiary of Kreuger & Toll, Ltd., has arranged for an increase in capital from 50,000,000 to 100,000,000 kroner ($13,400,000 to $26,800,000), a large part of the fund to be used in construction

of a new sulphate plant, reported to cost over $2,000,000, with machinery. Work on the mill will be carried out over a period of months, under direction of the parent organization.

Hodge, La.—The Advance Bag and Paper Co., Howland, Me., is reported to be considering the construction of a new paper mill in the vicinity of Hodge, La., for raw material supply. Details regarding site and estimates of cost are still to be determined. The project is in a preliminary stage.

New York, N. Y.—The Gotham Tissue Corporation, 312 Locust avenue, Bronx, has arranged for an increase in capital from $81,000 to $156,000, for general expansion.

Montreal, Que.—The Gatineau Power Company, Montreal, affiliated with the International Paper Company, New York, is proceeding with its hydroelectric power development on the Gatineau River, designed to increase the present hydroelectric generating capacity by 34,000 horsepower. The development will be carried out over a term of months. The company is now operating hydroelectric generating plants on the Gatineau and Ottawa Rivers with a total capacity of 565,519 horsepower, a considerable portion of which is being used at the news print mills of the parent organization. The company has arranged for a bond issue of $8,500,000, a portion of fund to be used in connection with the power expansion program. It also operates the Saint John River Power Company, with hydroelectric generating station at Grand Falls, New Brunswick.

Alexandria, Egypt—Plans are maturing for the construction of an experimental paper mill on a site near Alexandria. Initial plans have been approved by the Ministry of Agriculture and the Department of Commerce and Industry of the Government of Egypt. A list of machinery to be installed will be arranged at an early date. The project is headed by Hassan Nashat Pasha, Berlin, Germany, Egyptian Minister and representative of the Government at that place. It is understood that the American Consulate at Cairo, Egypt, has information regarding the project.

Boston Paper Market Conditions

[FROM OUR REGULAR CORRESPONDENT]

BOSTON, Mass., March 30, 1931.—March has shown a little improvement over February in the wholesale paper market, although business as a whole is as yet in only moderate volume. During the last two weeks some dealers' sales have not increased in amount, while among others there has been an improvement. In certain quarters of the fine paper market there have been more inquiries for dummies, quotations, etc., showing that consumers are figuring on prospective work. A number of sizable orders have resulted from the inquiries.

The outlook for increased business seems favorable, with the gradual improvement of industrial conditions as a whole. Among the lines showing more activity are blottings, envelopes, box coverings and greeting card materials. The price situation is very unsatisfactory, many of the trade complaining that values do not stiffen as they would like to see them. What is regarded as unfair competition is a matter of serious concern to many.

The wrapping paper market has improved, with a greater volume of sales. Specialties have been moving in fair-sized quantities. The boxboard market has been rather dull and draggy the last fortnight, although merchants look for a larger demand with a betterment of business generally.

Paper stock is quiet as a whole, although some lines, including old kraft, have shown a little activity in the last fortnight. Bagging and new and old domestic rags are practically unchanged. Domestic roofing rags are fairly steady. Foreign dark cottons are not in great demand, owing to the fact that domestic roofing rags seem to be coming into the market in sufficiently large quantities to supply the roofing mills, which are said to be operating at only about 50 per cent capacity.

W. H. Lee Visits Mills by Airplane

A normal month's business trip all up and down the Pacific coast accomplished in exactly eighteen days' time is the record of William H. Lee, treasurer and manager of the Lockport Felt Company and to this was added pleasure in the company of his wife and son, and several days of sightseeing, says the *Union-Sun and Journal*, of Lockport, N. Y.

The unusual accomplishment was made possible only by the comparatively recent art of aviation, Mr. Lee's seven place cabin Lockhead Vega monoplane and his airport associate and plane pilot Lieutenant Allan W. Van De Mark providing the motive power, traveling accommodations and engineering.

Mr. and Mrs. Lee and their 13-year-old son Raymond of Locust street, with Lieutenant Van De Mark of Maple street, stepped out of Mr. Lee's speedy and comfortably equipped plane at the Buffalo municipal airport at about 8 o'clock last evening having flown yesterday from Cheyenne, Wyo., a distance of approximately 1,600 miles, in 8 hours and 45 minutes. On Wednesday, they flew the 1,200 miles from Portland, Ore., to Cheyenne in six hours.

The Lockport quartet flew direct to this city last evening, but turned around and returned to Buffalo when warned by red lanterns in the hands of Van De Mark's brother-in-law and business associate, Jonathan Pfrang, Charles J. Christy and others, that a landing here would be dangerous because of the heavy crust over the deep snow at the local airport.

Taking off from the Lee-Van De Mark airport here, the morning of February 24 making the 3,000 mile trip westward in 15 hours and 45 minutes actual flying time. With the various business and pleasure side trips included, the Lee plane was flown 9,000 miles.

The transcontinental flight demonstrated to a gratifying degree the commercial possibilities of aviation, Mr. Lee feels, making it possible for an industrial executive to make personal contacts with other business heads in distant cities within a brief period of time otherwise impossible.

While on the Pacific coast, the Lockport quartet flew from Stockton, Calif., to Portland, Ore., in four hours, returning in a like period of time, with Mr. Lee transacting business in both cities the same day. The same trip by fast train, he states, would have taken a day and a night on the train, with one day each for the business transacted in the two cities.

This airplane business trip by Mr. Lee establishes a precedent for this locality, and gives indication that a new era of air travel is dawning—an epoch of aviation devoted more to commercial ends than to attaining speed and stunt records.

It means that a business executive of Lockport or the Niagara Frontier region can make day business flights to New York, Boston, Philadelphia, Detroit and Chicago, leaving in the morning and home in the evening. Such a saving in time represents a correspondingly great saving in expenses, it is freely admitted.

Rain, snow and hail were encountered yesterday, all the way across the State of Michigan, from Chicago to Detroit, and because of the unfavorable conditions, the ship was only partially refueled at Davenport, Ia., making another refueling stop necessary at Detroit. The ship left Cheyenne at 7 o'clock yesterday morning (Pacific Coast time).

Despite the unfavorable weather encountered both yesterday and Thursday, and the 9,000 miles traveled by the ship in the past 18 days, the Lockhead-Vega stood the trip in fine shape, both Mr. Lee and Lieutenant Van De Mark declare, proving her worth both as to speed, reliability and wear.

Near record time was accomplished on both the trips to and from the coast, Mr. Lee transacted business in Pacific coast cities from Los Angeles to Seattle, and he said that the orders he obtained convince him that business everywhere is decidedly picking up.

THE DRAPER FELTS

All kinds and styles of Felts for all kinds and styles of Papers.

Write us about your Felt problems and let us help you reduce your Felt Costs—we will call anywhere at any time.

DRAPER BROS. COMPANY

CANTON, MASS.

Woolen manufacturers since 1856

Starch

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Paper Mills use Starch for sizing to produce better and stronger sheets with lower cost of manufacture.

Our SPECIAL PAPER brand, furnished in either Pearl or Powdered form for beater-sizing, increases strength of sheet and gives improved finish.

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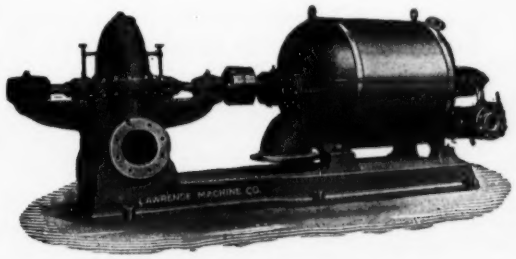
Horizontally Split Casing Double Suction Pumps

LAWRENCE PUMPS

The name protects and guarantees you satisfaction.

We are the original designers and builders of the LAWRENCE PUMP.



Lawrence pumps for all conditions and services. Forty-four years of practical experience with centrifugal pump development places us among the leaders. Our efforts have been rewarded by the acceptance of our product in general.

Thousands of installations and the successful performance of our pumps should be sufficient proof of our ability to handle your pumping problems. Our engineering force is at your command.

Have only Lawrence Pumps, manufactured by the

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A-E-CO WATER WALLS

A-E-CO Water Walls increase the capacity of a furnace by making it possible to operate at higher ratings. They protect the furnace walls and reduce maintenance. At the same time, they increase the efficiency with which the coal is burned by producing better conditions in the stoker fuel bed.

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2401 Aramingo Ave. PHILADELPHIA, PA.

IMPORTS OF PAPER AND PAPER STOCK

NEW YORK, BOSTON, PHILADELPHIA AND OTHER PORTS

NEW YORK IMPORTS

WEEK ENDING MARCH 28, 1931

SUMMARY

Cigarette paper	10 cs.
Wall paper	34 bls., 29 cs.
Paper hangings	40 bls., 4 cs.
News print	1477 rolls
Printing paper	81 rolls, 38 bls., 107 cs.
Wrapping paper	77 bls., 3 cs.
Transfer paper	21 cs.
Filter paper	192 bls., 12 cs.
Drawing paper	52 cs.
Colored paper	5 cs.
Coated paper	27 cs.
Metal coated paper	41 cs.
Basic paper	31 rolls
Aluminum paper	16 cs.
Tissue paper	7 cs.
Parchment paper	12 bls.
Raw paper	40 cs.
Decalcomania paper	50 cs.
Writing paper	15 cs.
Stencil paper and ink	31 cs.
Wafer paper	3 cs.
Pith paper	2 cs.
Envelopes	3 cs.
Miscellaneous paper	10 rolls, 369 bls., 107 cs.

CIGARETTE PAPER

F. Murray Hill Co., Majestic, Southampton, 5 cs.

Brown & Williamson Tobacco Corp., Berengaria, Southampton, 5 cs.

WALL PAPER

Irving Trust Co., Milwaukee, Hamburg, 10 cs.

Hensel, Bruckman & Lorbacher, Milwaukee, Hamburg, 7 bls.

W. H. S. Lloyd & Co., Amer. Merchant, London, 8 bls., 1 cs.

New York Trust Co., Amer. Merchant, London, 1 cs.

R. F. Downing & Co., Sanyo Maru, Yokohama, 12 cs.

——, Majestic, Southampton, 1 cs.

——, Clyde Maru, Hamburg, 15 bls.

Irving Trust Co., Deutschland, Hamburg, 4 cs.

Globe Shipping Co., Deutschland, Hamburg, 4 bls.

PAPER HANGINGS

A. C. Dodman, Jr., Inc., Baltic, Liverpool, 36 bls.

Whiting & Patterson Co., Inc., Majestic, Southampton, 2 cs.

Whiting & Patterson Co., Inc., Berengaria, Southampton, 4 bls., 2 cs.

NEWS PRINT

Stora Kopperberg Corp., Gripsholm, Gothenburg, 60 rolls.

——, Bergensfjord, Oslo, 219 rolls.

Perkins, Goodwin & Co., Milwaukee, Hamburg, 446 rolls.

——, Milwaukee, Hamburg, 129 rolls.

Perkins, Goodwin & Co., Deutschland, Hamburg, 410 rolls.

Baldwin Paper Co., Deutschland, Hamburg, 213 rolls.

PRINTING PAPER

T. N. Fairbanks Co., Saturnia, Trieste, 8 cs.

——, Milwaukee, Hamburg, 68 rolls, 38 bls.

International F'd'g Co., N. Amsterdam, Rotterdam, 11 cs.

E. Dietzgen & Co., N. Amsterdam, Rotterdam, 69 cs.

P. C. Zuhlke, N. Amsterdam, Rotterdam, 2 cs.

Globe Shipping Co., Karlsruhe, Bremen, 1 cs.

Keuffel & Esser, Pr. Roosevelt, Hamburg, 16 cs., 13 rolls.

WRAPPING PAPER

T. Barrett & Son, Gripsholm, Gothenburg, 77 bls.

——, N. Amsterdam, Rotterdam, 2 cs.

Yardley & Co., Ausonia, London, 1 cs.

TRANSFER PAPER

F. L. Kramer & Co., Pr. Roosevelt, Hamburg, 21 cs.

FILTER PAPER

H. Reeve Angel & Co., Inc., Ausonia, London, 12 cs.

J. Manheimer & Co., Majestic, Southampton, 192 bls.

DRAWING PAPER

H. Reeve Angel & Co., Inc., Ausonia, London, 3 cs.

J. Henschel & Co., Deutschland, Hamburg, 2 cs.

Keuffel & Esser Co., Pr. Roosevelt, Hamburg, 47 cs.

COLORED PAPER

National Freight F'd'g Co., Milwaukee, Hamburg, 2 cs.

H. Lange Corp., Karlsruhe, Bremen, 1 cs.

Henschel Naeve Co., Karlsruhe, Bremen, 2 cs.

COATED PAPER

Bank of America Natl. Assn., Milwaukee, Hamburg, 13 cs.

Bank of America Natl. Assn., Deutschland, Hamburg, 11 cs.

W. A. Foster & Co., Amer. Merchant, London, 3 cs.

METAL COATED PAPER

K. Pauli Co., Milwaukee, Hamburg, 6 cs.

——, Milwaukee, Hamburg, 15 cs.

——, Deutschland, Hamburg, 20 cs.

SURFACE COATED PAPER

P. C. Zuhlke, N. Amsterdam, Rotterdam, 11 cs.

BASIC PAPER

C. Bruning Co., N. Amsterdam, Rotterdam, 31 rolls.

ALUMINUM PAPER

Keller, Dorian Paper Co., Karlsruhe, Bremen, 16 cs.

TISSUE PAPER

Meadows, Wye & Co., Baltic, Liverpool, 1 cs.

B. F. Drakenfeld & Co., Baltic, Liverpool, 5 cs.

W. J. Byrnes, Berengaria, Southampton, 1 cs.

PARCHMENT PAPER

Quality Art Novelty Co., Milwaukee, Hamburg, 12 bls.

RAW PAPER

Agfa Ansco Corp., Milwaukee, Hamburg, 40 cs.

DECALCOMANIA PAPER

C. W. Sellers, Milwaukee, Hamburg, 11 cs.

C. W. Sellers, Deutschland, Hamburg, 17 cs.

Phoenix Shipping Co., Deutschland, Hamburg, 1 cs.

B. F. Drakenfeld & Co., Baltic, Liverpool, 21 cs. (duplex)

WRITING PAPER

American Express Co., Ile de France, Havre, 3 cs.

Titan Shipping Co., Ile de France, Havre, 6 cs.

B. Altman & Co., Ile de France, Havre, 1 cs.

Manufacturers Trust Co., Majestic, Southampton, 4 cs.

STENCIL PAPER AND INK

Arlac Dry Stencil Co., Milwaukee, Hamburg, 13 cs.

Arlac Dry Stencil Co., Deutschland, Hamburg, 12 cs.

Baltic Shipping Co., Deutschland, Hamburg, 6 cs.

WAFER PAPER

Ipex, N. Amsterdam, Rotterdam, 3 cs.

PITH PAPER

Nosawa & Co., Havana Maru, Keelung, 2 cs.

ENVELOPES

Simfred Co., Inc., Deutschland, Hamburg, 3 cs.

MISCELLANEOUS PAPER

The Borregaard Co., Inc., Gripsholm, Gothenburg, 10 rolls.

Kreamer & Co., Gripsholm, Gothenburg, 350 bls.

J. P. Heffernan Paper Co., Gripsholm, Gothenburg, 19 bls.

Steiner Paper Corp., N. Amsterdam, Rotterdam, 44 cs.

Keuffel & Esser Co., N. Amsterdam, Rotterdam, 6 cs.

J. Beckhard Co., N. Amsterdam, Rotterdam, 3 cs.

S. F. Berliner, Sanyo Maru, Kobe, 4 cs.

Steiner Paper Corp., Sanyo Maru, Kobe, 3 cs.

Japan Import & Export Commission Co., Sanyo Maru, Kobe, 20 cs.

C. L. Vorhees, Sanyo Maru, Yokohama, 6 cs.

Keller Dorian Paper Co., Ile de France, Havre, 5 cs.

Saybusch Paper Manfg. Co., Clyde Maru, Hamburg, 10 cs.

Hensel, Bruckman & Larbacher, Karlsruhe, Bremen, 6 cs.

RAGS, BAGGING, ETC.

New York Trust Co., Milwaukee, Hamburg, 44 bls. nappers.

Royal Bank of Canada, Milwaukee, Hamburg, 100 bls. thread waste.

Chemical Bank & Trust Co., City of Alton, Rotterdam, 126 bls. rags.

Darmstadt, Scott & Courtney, City of Alton, Rotterdam, 28 bls. thread waste.

R. F. Downing & Co., California, Glasgow, 103 bls. bagging.

Baring Bros. & Co., California, Glasgow, 92 bls. paper stock.

International Accep. Bank, Clyde Maru, Hamburg, 63 bls. rags.

International Trust Co., Lepanto, Antwerp, 185 bls. bagging.

E. J. Keller Co., Inc., Lepanto, ——, 59 bls. rags.

E. J. Keller Co., Inc., Ambridge, ——, 63 bls. bagging.

——, Pr. Roosevelt, Hamburg, 63 bls. bagging.

S. Birkenstein & Son, Estrella, Valencia, 188 bls. rags.

Irving Trust Co., Estrella, Barcelona, 58 bls. bagging.

Chemical Bank & Trust Co., Estrella, Barcelona, 116 bls. rags.

V. Galaup, Livenza, Genoa, 42 bls. bagging.

Hibernia Trust Co., Saturnia, Trieste, 232 bls. bagging; 44 bls. rags.

OLD ROPE

Chemical Bank & Trust Co., Milwaukee, Hamburg, 32 coils.

Chemical Bank & Trust Co., Ambridge, Antwerp, 59 coils.

Castle & Overton, Inc., N. Amsterdam, Rotterdam, 43 coils.

S. Birkenstein & Son, Estrella, Barcelona, 38 coils.

CASEIN

Casein Manfg. Co., Western Prince, B. Ayres, 834 bags, 50040 kilos.

Tupman, Thurlow & Co., Inc., Western Prince, B. Ayres, 167 bags, 10020 kilos.

WOOD PULP

Bulkley, Dunton & Co., Gripsholm, ——, 500 bls. sulphate.

Perkins, Goodwin & Co., Gripsholm, Gothenburg, 442 bls. sulphatae; 179 bls. kraft pulp.

E. M. Sergeant & Co., Gripsholm, Gothenburg, 200 bls. sulphite; 599 bls. kraft soda pulp.

Price & Pierce, Ltd., Gripsholm, Gothenburg, 125 bls. wood pulp.

Irving Trust Co., Bergensfjord, Drammen, 3200 bls. sulphite.

Castle & Overton, Inc., Milwaukee, Hamburg, 381 bls. wood pulp, 77 tons.

Castle & Overton, Inc., City of Alton, Rotter-

(Continued on page 68)

Cotton and Paper Rolls
Super Calenders
Friction Calenders
Embossing Calenders
Hydraulic Presses and Pumps

Successors to the Granger Foundry & Machine Co.

The Textile-Finishing Machinery Company
PROVIDENCE, R. I.

Sulphur

A FIRST REQUISITE

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Large Production
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Prompt Deliveries
Purity 99½%

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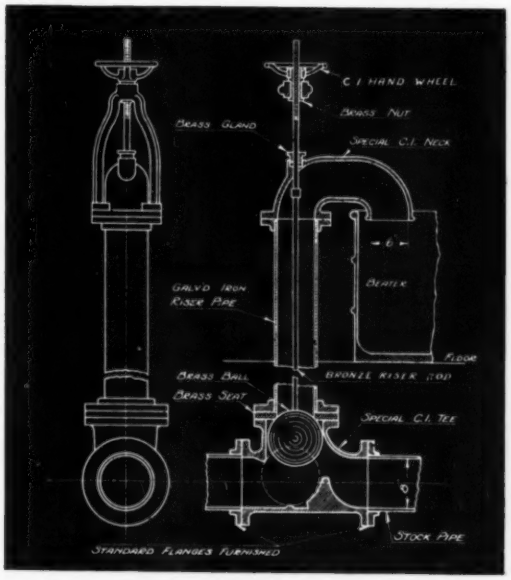

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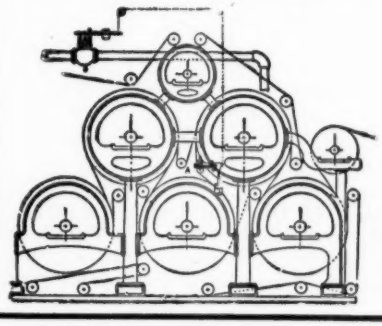

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Pickles Drying Regulator

will do everything we claim for it and more. The test costs you nothing until you are satisfied. Many mills tried one and now have every machine equipped. Write for list of users and other information.

W. F. PICKLES **Buckland, Conn.**

Imports of Paper and Paper Stock

(Continued from page 66)

dam, 360 bls. wood pulp, 56 tons.
M. Gottesman & Co., Inc., City of Alton, Rotterdam, 525 bls. sulphite, 52 tons.
J. Andersen & Co., Tonsbergfjord, Greaker, 3285 bls. sulphite.
Russell McCandless, Tonsbergfjord, Greaker, 250 bls. bleached sulphite.
E. J. Keller Co., Inc., Clyde Maru, ——, 340 bls. wood pulp, 50 tons.
Castle & Overton, Inc., Deutschland, Hamburg, 2300 bls. wood pulp, 460 tons.
——, Deutschland, Hamburg, 305 bls. wood pulp, 61 tons.
——, Pr. Roosevelt, Hamburg, 369 bls. wood pulp, 57 tons.

WOOD FLOUR

A. Kramer & Co., Inc., N. Amsterdam, Rotterdam, 200 bags.
The Burnet Co., City of Alton, Rotterdam, 480 bls., 789 bags; 58195 kilos.

BALTIMORE IMPORTS

WEEK ENDING MARCH 28, 1931

W. H. Masson, Ambridge, Antwerp, 54 coils old rope.
Bulkley, Dunton & Co., Riol, ——, 1500 bls. wood pulp.

BOSTON IMPORTS

WEEK ENDING MARCH 28, 1931

Russell McCandless, America, Oslo, 800 bls. unbleached sulphite; 500 bls. ground pulp.
Russell McCandless, America, Greaker, 125 bls. bleached sulphite.

NORFOLK IMPORTS

WEEK ENDING MARCH 28, 1931

E. Butterworth & Co., Inc., Ambridge, Antwerp, 35 bls. bagging.
Belgam Corp., Ambridge, Antwerp, 56 bls. bagging.

GALVESTON IMPORTS

WEEK ENDING MARCH 28, 1931

Southern Trading Co., Karlsruhe, Hamburg, 156 rolls paper.

HOUSTON IMPORTS

WEEK ENDING MARCH 28, 1931

Southern Trading Co., Karlsruhe, Hamburg, 49 rolls paper.

PHILADELPHIA IMPORTS

WEEK ENDING MARCH 28, 1931

H. W. T. Mali & Co., Sanyo Maru, Kobe, 150 bls. rags.
Pittsburgh Waste Co., Sanyo Maru, Kobe, 100 bls. rags.
Union Waste Co., Sanyo Maru, Kobe, 40 bls. rags.
Brown Bros., Harriman & Co., Sanyo Maru, Kobe, 125 bls. rags.
Castle & Overton, Inc., Estrella, Barcelona, 59 coils old rope; 136 bls. rags.
Banco Coml. Italiane Trust Co., Estrella, Savona, 221 bls. bagging.
Bulkley, Dunton & Co., Koeln, ——, 550 bls. wood pulp.
Russell McCandless, America, Oslo, 800 bls. unbleached sulphite.
Russell McCandless, America, Greaker, 125 bls. unbleached sulphite.
Parsons & Whittemore, Inc., Hagen, ——, 800 bls. sulphite.

Union Bag Fire Chief Resigns

[FROM OUR REGULAR CORRESPONDENT]

HUDSON FALLS, N. Y., March 30, 1931.—Announcement is made of the resignation of George Nolan as fire chief and safety engineer at the plant of the Union Bag and Paper Company after having served in that capacity for the past ten years. George S. Witham, formerly general manager, was largely instrumental for the formation of the fire brigade soon after the company suffered a large loss in a pulp wood conflagration near Fenimore and the selection of Mr. Nolan as chief was unanimous. A modern fire pumper as well as other apparatus was purchased by the company to protect its property and a large number of firemen were given steady jobs. Most of the equipment was recently disposed of, however, and the organized fire department of the concern passes out of existence with the resignation of the chief.

New Brunswick's Pulpwood Industry

[FROM OUR REGULAR CORRESPONDENT]

MONTREAL, Que., March 23, 1931.—The annual report of the Department of Lands and Mines for New Brunswick states that the manufacture of pulpwood in the province increased about 30 per cent in 1930 as compared with the previous year.

The report recounts the opening of the New Brunswick International Paper Company's mill at Dalhousie on March 14, 1930, since when its installed capacity has been increased to a daily production of 550 tons of news print, and, also, the completion and opening of the high grade bleached sulphite pulp mill at Athol by Restigouche Company, Limited, a subsidiary of the Fraser Companies. Dealing with the cost of timber in 1930, the quantities of pulpwood manufactured and exported and the prospective cut for this year, the Deputy Minister, G. H. Prince, in his report to the Minister of Lands and Mines says:

"The timber cut in the past logging season of 1929-30, namely 203 million feet of green timber, was somewhat under the estimate of 212 million. The amount of fire-killed wood salvaged amounted to 21 million as compared with 26 million of the preceding year.

Recent statistics indicate that 409,598 cords, or 205 million feet of wood, was manufactured in our pulp and paper mills during 1930. The total amount manufactured in the mills in New Brunswick in 1930 is approximately 100,000 cords greater than the preceding year, when the amount was 314,000 cords. The pulpwood exported from New Brunswick in 1930 amounted to 165,280 cords, making the total amount of pulpwood manufactured in New Brunswick or exported 574,835 cords. During 1930, 61 million feet of green pulpwood and 21 million of fire-killed pulpwood were removed from the Crown Lands as compared with a total of 56 million feet the preceding year. In considering these figures, it must be borne in mind that the wood manufactured any year is taken largely from the preceding years cut.

"It is estimated from information now available that the cut, including logs, poles, pulpwood, ties, etc., will be equivalent to 80,000,000 feet of green timber, and in addition 10,000,000 feet of fire-killed pulpwood which is still being salvaged from the forest fires of 1923. This is less than half the cut of the preceding year, and indicates the seriousness of the depression from which the forest industries are suffering. In cooperation with the Federal Government a reduction of approximately $1.00 per M was made in the various stumpage rates for the purpose of assisting in relieving unemployment by stimulating logging operations, and it is apparent that the reduction in stumpage has resulted in increased employment in the woods."

Suit Against Island Paper Co. Adjourned

[FROM OUR REGULAR CORRESPONDENT]

CARTHAGE, N. Y., March 31, 1931.—The case of Mrs. Catherine Bellinger against the Island Paper Company was adjourned until April 8 at a hearing before Attorney Howard B. Donaldson, as referee, held during the past week. Mr. Bellinger, a pulpwood contractor, died in 1927 and the widow is now seeking missing records regarding his transactions with the paper concern. It is understood that the information will be used as a basis to start action by the plaintiff for the recovery of a substantial amount alleged to be due on the pulpwood contracts. The next hearing is to be held mainly for the purpose of obtaining information from officials of the paper company regarding the contracts made with Herbert Bellinger several years ago for cutting, hauling and delivering pulpwood.

New Distributor for Brown's Linen Ledger

The Zellerbach Paper Company of Phoenix, Ariz., has been made a distributor of Brown's Linen Ledger permanent record ledger paper, made by L. L. Brown Paper Company of Adams, Mass.

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Bleached Sulphite

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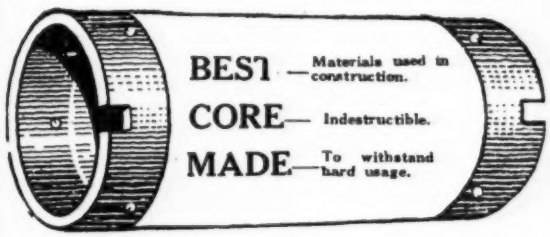

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New York Market Review

Office of the PAPER TRADE JOURNAL.
Wednesday, April 1, 1931.

Trading in the local paper market was moderately active during the past week. Most of the standard grades of paper were in seasonal request. The movement of supplies into consumption was fairly satisfactory. Sales forces of the leading paper organizations are conducting a strenuous campaign for new business. Prices are generally holding to formerly quoted levels.

Efforts are apparently still being made to stabilize the news print industry through mergers or otherwise. Production was maintained at 59 per cent of rated capacity in the United States and Canada during the past week, according to information gathered by the News Print Service Bureau. Shipments are going forward at 59 per cent of rating.

Some improvement was noticed in the paper board market. Box board manufacturers are operating at approximately 74 per cent of capacity. Prices generally remain unaltered. The fine paper market continues comparatively steady. Conditions in the coarse paper market are seasonal. Kraft wrapping paper is firmer and is now quoted at 3.50 delivered.

Mechanical Pulp

Although the ground wood market was rather quiet, the industry continues in a sound statistical position. Offerings of both domestic and imported mechanical pulp are not excessive, due to recent curtailment of production in this country and abroad. Inquiries for future needs are fairly numerous. Prices are holding to schedule, in most instances.

Chemical Pulp

Notwithstanding the strike of the Norwegian pulp mill workers, the local chemical pulp market is practically unchanged. Imported bleached sulphite is still offered at from $2.60 to $4.25, on dock, Atlantic ports, and easy bleaching sulphite at from $2.25 to $2.40. Domestic bleached sulphite is selling at from $2.40 to $4.75, f.o.b., pulp mill, and easy bleaching sulphite is quoted at from $2.55 to $2.75.

Old Rope and Bagging

The old rope market was decidedly dull during the past week. Demand for old manila rope was light. Small mixed rope was in moderate request. Old rope prices are practically unaltered. The bagging market was fairly active. Scrap and gunny are moving in seasonal volume. Domestic roofing bagging is arousing more interest and offerings are somewhat limited.

Rags

Irregular conditions prevail in the domestic rag market. Cotton cuttings are quiet. No. 1 new white shirt cuttings are now offered at from $7.50 to $8.00. The roofing grades are firmer than for some time past. Mixed rags are dull. The imported rag market showed little improvement, with the exception of the roofing grades, which are beginning to arouse more interest.

Waste Paper

Paper mill interest in the waste paper market has been more encouraging than of late, although prices continue unsatisfactory. Hard white shavings are offered at from $2.75 to $2.85 and soft white shavings at from $2.30 to $2.40. White envelope cuttings are now quoted at from $2.80 to $2.95. Old kraft machine compressed bales are selling at from $1.10 to $1.20.

Twine

Most of the business transacted in the local twine market was along routine lines. Demand for the various grades is fairly satisfactory and should continue active for several weeks to come, at least. There are a fair number of inquiries around for future account. Prices are generally being maintained at formerly quoted levels and reports of shading are infrequent.

Brotherhood Elects Officers

[FROM OUR REGULAR CORRESPONDENT]

GLENS FALLS, N. Y., March 16, 1931.—At the annual convention of the International Brotherhood of Pulp, Sulphite and Paper Mill Workers held this week at Montreal the officers were chosen for the next two years. John P. Burke, of Fort Edward, was re-elected president and secretary and had no opposition in the voting. Some lively contests were staged for the offices of vice president and the Canadian faction made a vigorous attempt to increase their strength. They were successful in electing Harry H. Beach, of Iroquois Falls, Ontario, over A. C. Krueger, of International Falls, Minn., but failed in an effort to displace Reinhart Henke, of Wisconsin Rapids, with Alec Gibson, of Port Arthur, Ontario. A movement under way to displace H. W. Sullivan as second vice president proved of no avail as this veteran of every convention since the founding of the organization proved himself too strongly intrenched and he was elected unanimously.

The executive council as now constituted includes John P. Burke, president-secretary; Maurice LaBelle, Ottawa, Ont., first vice president; H. W. Sullivan, Worcester, Mass., second vice president; J. W. Taylor, Penobscot, Maine, third vice president; William H. Burnell, Espanola, Ont., fourth vice president; Reinhart Henke, Wisconsin Rapids, fifth vice president; Harry H. Beach, Iroquois Falls, Ont., sixth vice president; Bartholomew Doody, Palmer, N. Y., treasurer. The delegates to the American Federation of Labor Convention include Mr. Burke and H. W. Sullivan and those of the Canadian Trade and Labor Congress Mr. LaBelle and Alex Gibson of Port Arthur, Ont. George Brooks, of Hudson Falls, was elected auditor.

Lynch's Country Home Destroyed By Fire

[FROM OUR REGULAR CORRESPONDENT]

GREENWICH, Conn., March 30, 1931—Fire recently destroyed the country residence of F. R. V. Lynch, vice-president of the Seaman Paper Company, of New York, on Stanwich road, with a loss estimated at more than $50,000. Four fire companies responded in attempts to save the house, about six miles from the center of the town. Water from a lake on the estate was used in efforts to extinguish the flames. Some of the furnishings were saved. The fire originated in an upper room while the family was at home. Firemen said the cause may have been defective wiring.

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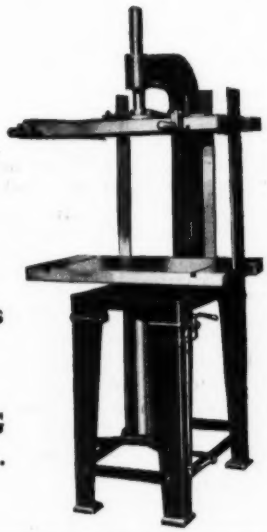

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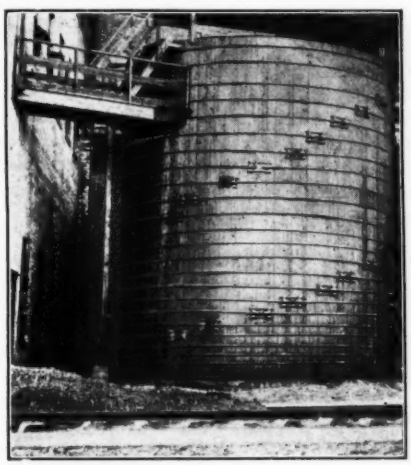

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Kalamazoo Tank & Silo Co., Kalamazoo, Mich.

Miscellaneous Markets

Office of the PAPER TRADE JOURNAL,
Wednesday, April 1, 1931.

BLANC FIXE.—Trading in the blanc fixe market was moderately active. The contract movement was well up to average. Prices are unchanged. The pulp is quoted at from $42.50 to $45.00 per ton, while the powder is selling at from 3¾ cents to 4½ cents a pound, in barrels, at works.

BLEACHING POWDER.—The bleaching powder market is in a sound position. Contract shipments are going forward to the paper mills in good volume. Prices are generally holding to previously quoted levels. Bleaching powder is quoted at from $2.00 to $2.35 per 100 pounds, in drums, at works.

CASEIN.—Further weaknesses developed in the casein market. Domestic standard ground is now quoted at 8 cents and finely ground at 9 cents per pound. Argentine standard ground is selling at 9½ cents and finely ground at 10 cents per pound, all in bags, car lot quantities.

CAUSTIC SODA.—The caustic soda market was practically unchanged. Shipments against contract were fairly heavy. Prices remain unaltered. Solid caustic soda is quoted at from $2.50 to $2.55; while the flake and the ground are selling at from $2.90 to $2.95 per 100 pounds, in large drums, at works.

CHINA CLAY.—Conditions in the china clay market are fairly satisfactory. The contract movement is mainly seasonal. Prices remain unchanged. Imported china clay is quoted at from $13 to $21 per ton, while domestic paper making clay is selling at from $8 to $13 per ton, at mine.

CHLORINE.—The chlorine market continues to show improvement. Supplies are moving into consumption in good volume for the time of the year. Inquiries for future needs are fairly numerous. Chlorine is quoted at $2.50 per 100 pounds, in tanks, or multi-unit cars, in ton lots, or over, at works.

ROSIN.—Demand for rosin is fairly persistent. Prices are holding up well. The grades of gum rosin used in the paper mills are still quoted at from $5.90 to $6.30 per 280 pounds, in barrels, at yards Wood rosin is selling at $4.50 per 280 pounds, in car lots, at southern shipping points.

SALT CAKE.—The salt cake market is rather quiet at present. Demand is mostly along routine lines. Prices are generally holding to schedule. Salt cake is quoted at from $16 to $17; German salt cake at from $15.50 to $16 and chrome salt cake at from $14 to $15 per ton, in bulk, at works.

SODA ASH.—Business in the soda ash market was fairly active. Offerings are sufficient to take care of current requirements. Prices are holding to schedule. Contract quotations on soda ash, in car lots, at works, per 100 pounds, are as follows: in bulk, $1.00; in bags, $1.15; and in barrels, $1.38.

STARCH.—No further changes were reported in the starch market. Shipments against contract are going forward at a fairly steady pace. Prices are holding to previously quoted levels. Special paper making starch is selling at $2.67, in bags; and at $2.94 per 100 pounds, in barrels.

SULPHATE OF ALUMINA.—The sulphate of alumina market is in a sound position. While demand is mainly seasonal, the contract movement is fairly heavy. Commercial grades are quoted at from $1.25 to $1.40; while iron free is selling at from $1.90 to $2.05 per 100 pounds, in barrels, at works.

SULPHUR.—Most of the business transacted in the sulphur market was routine. Sulphur is quoted at $18 per long ton, on orders of 1,000 tons, or over, on yearly contracts; and at $20 per ton for any smaller quantity over that period. On spot and near by car loads the quotation is $21 per ton.

TALC.—The talc market pursues the even tenor of its way. Demand from the paper mills is fairly active. Prices are holding to schedule Domestic talc is quoted at from $16 to $18 per ton, in bulk; while imported talc is selling at from $18 to $22 per ton, in bags, ship side.

Market Quotations

Paper
(F. o. b. Mill)

Ledgers	11.00	@	38.00
Bonds	6.75	@	53.25
Writings—			
Extra Superfine	14.00	@	32.00
Superfine	14.00	@	32.00
Tub sized	10.00	@	15.00
Engine sized	6.75	@	11.00
Book, Cased—			
S. & S. C.	5.50	@	—
M. F.	5.25	@	—
Coated and Enamel	7.00	@	10.50
Lithograph	7.50	@	12.00
Tissues—Per Ream—			
White No. 1	.65	@	.67½
Anti-Tarnish M G only	.65	@	.70
Colored	.70	@	.90
White No. 2	.55	@	.57½
Kraft	.65	@	.70
Manila	.55	@	.57½
Manila—			
No. 1 Jute	9.00	@	9.25
No. 2 Jute	7.75	@	8.50
No. 1 Wood	4.00	@	5.25
No. 2 Wood	3.50	@	4.00
Butchers	3.37½	@	—
Fibre Papers—			
No. 1 Fibre	4.25	@	5.50
No. 2 Fibre	4.00	@	4.75
Common Bogus	1.50	@	3.00
Screenings	2.00	@	3.00
Card Middles	4.00	@	5.00
Glassine—			
Bleached, basis 25 lbs., No. 1	.09¾	@	—
No. 2	.11¾	@	—
Bleached, basis 20 lbs.	.11¾	@	—
(Delivered New York)			
News, per ton—			
Rolls, contract	62.00	@	—
Rolls, spot	62.00	@	—
Sheets	67.00	@	—
Side Runs	47.00	@	52.00
Kraft—			
No. 1 Domestic	4.25	@	5.30
No. 2 Domestic	3.50	@	4.00
Southern	3.50	@	4.00
Imported	6.00	@	7.00
Boards—per ton—			
News	30.00	@	32.00
Straw	40.00	@	45.00
Chip	30.00	@	32.00
Binders' Boards	65.00	@	70.00
Standard 85 Test Liner	35.00	@	40.00
Sgl. Mla. Lt. Chip. (F. o. b. Mill)	42.50	@	—
Wood Pulp Boards	70.00	@	80.00

Mechanical Pulp
(On Dock)

No. 1 Imported—			
Moist	28.00	@	32.00
Dry	30.00	@	34.00
(F. o. b. Mill)			
No. 1 Domestic	28.00	@	34.00

Chemical Pulp
(On Dock, Atlantic Ports)

Sulphite (Imported)—			
Bleached	2.60	@	4.25
Easy Bleaching	2.25	@	2.40
No. 1 strong unbleached	2.00	@	2.35
Mitscherlich unbleached	2.10	@	2.70
No. 2 strong unbleached	1.90	@	2.00
No. 1 Kraft	1.40	@	1.75
No. 2 Kraft	1.35	@	1.55
Sulphate—			
Bleached	2.75	@	3.25
(F. o. b. Pulp Mill)			
Sulphite (Domestic)—			
Bleached	2.40	@	4.75
Easy Bleachings	2.55	@	2.75
News	1.80	@	2.50
Mitscherlich	2.50	@	3.25
Kraft (Domestic)	1.60	@	2.75
Delivered Paper Mills)			
Soda Bleached	3.00	@	—

Domestic Rags
New Rags
(Prices to Mill f. o. b N. Y.)

Shirt Cuttings—			
New White, No.1	7.50	@	8.00
New White, No. 2	6.50	@	7.00
Silesias No. 1	5.75	@	6.00
New Unbleached	8.00	@	8.50
New Blue Prints	4.50	@	5.00
New Soft Blacks	4.00	@	4.50
Blue Overall	5.50	@	6.00
Washables	3.75	@	4.00
Fancy	4.00	@	4.50
Mixed Khaki Cuttings	4.25	@	5.25
Pink Corset Cuttings	6.50	@	7.00
O. D. Khaki Cuttings	5.15	@	5.75
Men's Corduroy	3.00	@	3.50
New Mixed Blacks	3.00	@	3.25
Old Rags			
White, No. 1—			
Repacked	5.25	@	5.75
Miscellaneous	4.25	@	4.75
White, No. 2—			
Repacked	3.00	@	3.50
Miscellaneous	2.30	@	2.50
St. Soiled, White	1.50	@	1.75
Thirds and Blues—			
Repacked	2.25	@	2.50
Miscellaneous	1.65	@	1.85
Black Stockings	3.25	@	3.75
Roofing Rags—			
Cloth Strippings	1.25	@	1.30
No. 1	1.25	@	1.30
No. 2	.90	@	1.00
No. 3	.70	@	.80
No. 4	.65	@	.70
No. 5A	.50	@	.60

Foreign Rags
New Rags

New Dark Cuttings	2.00	@	2.15
New Mixed Cuttings	2.10	@	2.40
New Light Silesias	5.50	@	5.75
Light Flannelettes	6.25	@	6.75
Unbleached Cuttings	7.50	@	8.00
New White Cuttings	7.25	@	7.75
New Light Oxfords	5.50	@	5.75
New Light Prints	3.75	@	4.25
Old Rags			
No. 1 White Linens	7.00	@	7.50
No. 2 White Linens	5.50	@	6.00
No. 3 White Linens	4.00	@	4.50
No. 4 White Linens	2.50	@	3.00
No. 1 White Cotton	5.00	@	5.50
No. 2 White Cotton	4.00	@	4.50
No. 3 White Cotton	2.75	@	3.75
No. 4 White Cotton	1.60	@	1.75
Extra Light Prints	2.50	@	2.75
Ord. Light Prints	2.10	@	2.25
Med. Light Prints	1.65	@	1.75
Dutch Blue Cottons	1.90	@	2.10
French Blue Linens	2.65	@	2.75
German Blue Linens	2.25	@	2.40
German Blue Cottons	1.75	@	1.85
Checks and Blues	1.60	@	1.75
Lindsay Garments	1.10	@	1.20
Dark Cottons	.80	@	.90
Old Shopperies	.75	@	.80
New Shopperies	.75	@	.80
French Blues	1.80	@	1.90

Old Rope and Bagging
(Prices to Mill f. o. b. N. Y.)

Gunny No. 1—			
Foreign	1.65	@	1.80
Domestic	1.65	@	1.80
Wool Tares, light	1.30	@	1.40
Wool Tares, heavy	1.30	@	1.40
Bright Bagging	1.30	@	1.35
Small Mixed Rope	.90	@	1.00
Manila Rope—			
Foreign	2.05	@	2.25
Domestic	2.20	@	2.25
New Burlap Cut	2.10	@	2.25
Hessian Jute Threads—			
Foreign	2.60	@	2.75
Domestic	2.80	@	3.00

Old Waste Papers
(F. o. b. New York)

Shavings—			
Hard, white, No. 1	2.75	@	2.85
Hard White, No. 2	2.20	@	2.30
Soft, white, No. 1	2.30	@	2.40
White envelope cuttings	2.80	@	2.95
Flat Stock—			
Stitchless	.85	@	.95
Overissue Mag.	.85	@	.95
Solid Flat Book	.55	@	.65
Crumpled No. 1	.60	@	.65
Solid Book Ledger	1.75	@	1.85
Ledger Stock	.75	@	.85
New B. B. Chips	.20	@	.30
Manilas—			
New Env. Cut	2.00	@	2.20
New Cuttings	1.50	@	1.65
Extra No. 1 old	1.25	@	1.35
Print	.50	@	.60
Bogus Wrapper	.50	@	.60
Container	.25	@	.30
Old Kraft Machine—			
Compressed bales	1.10	@	1.20
News—			
No. 1 White News	1.60	@	1.70
Strictly Overissue	.40	@	.45
Strictly Folded	.30	@	.35
No. 1 Mixed Paper	.15	@	.25
Common Paper	Nominal		

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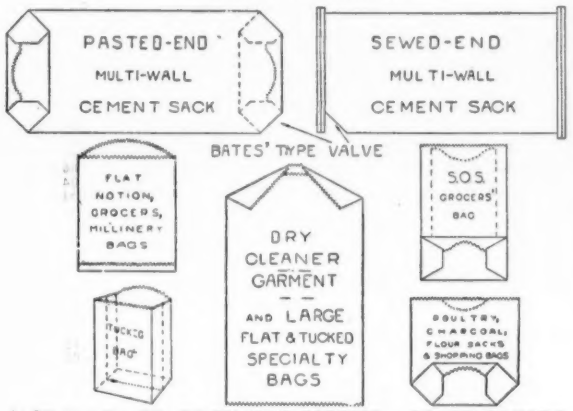
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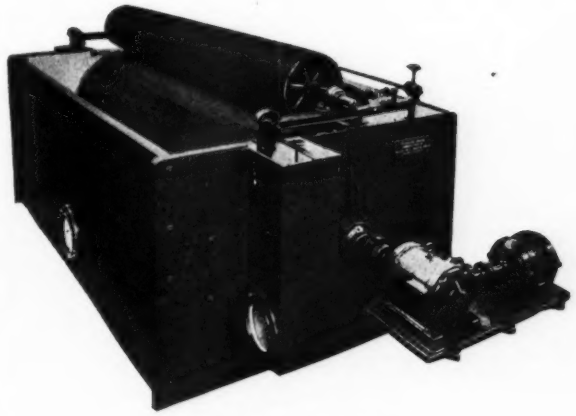

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Cotton—			
B. C., 18 basis	.32	@	.34
No. 1	.22	@	.24
No. 2	.21	@	.22
No. 3	.19	@	.20
A. Italian, 18 basis	.38	@	.39
Finished Jute—			
Dark 18 basis	.20½	@	.21
Light 18 basis	.22½	@	—
Jute Wrapping, 3-6 Ply—			
No. 1	.14¾	@	—
No. 2	.13¾	@	—
Tube Rope—			
4-ply and larger	.10¼	@	—
Fine Tube Rope—			
4-ply	.12¾	@	—
3-ply	.13¾	@	—
2-ply	.14¾	@	—
Paper Makers Twine			
Balls	.08¾	@	—
Box Twine, 2-3 ply	.09	@	.10
Jute Rope	.11	@	.12
Amer. Hemp, 6	.29	@	.31
Java Sisal			
No. 1 Basis	.12	@	—
No. 2 Basis	.11¾	@	—
New Zealand Sisal	.11½	@	—
Sisal Lath Yarn—			
No. 1	.14	@	.16
No. 2	.12	@	.14
Manila Twine	.22½	@	.24½

CHICAGO

Paper
(F. o. b. Mill)

Rag Bond	.30	@	.53¾
Water Marked Sulphite Bond	.09	@	.12
Sulphite Bond	.06¾	@	.11
Superfine Writing	.18	@	.24
No. 1 Fine Writing	.14	@	.18
No. 2 Fine Writing	.12	@	.14
No. 3 Fine Writing	.08½	@	.12
No. 1 M. F. Book	.06½	@	.07¾
No. 2 M. F. Book	.05¼	@	.06¼
No. 1 S.&S.C. Book	.06¾	@	.07¾
No. 2 S.&S.C. Book	05¾	@	.06½
Coated Book	.07½	@	.12
Coated Label	.07½	@	.10
No. 1 Manila	.04¼	@	.05¾
No. 1 Fibre	.04¾	@	.05¼
No. 2 Manila	.04¼	@	.04¾
Butcher's Manila	.04	@	.04½
No. 1 Kraft	5.00	@	5.50
Southern Kraft	3.75	@	4.00
No. 2 Kraft	3.75	@	4.00
Wood Tag Boards	.04¼	@	.06¼
Sulphite Screenings	.03	@	.03¼
Manila Tissue	.07	@	.07¼
White Tissue	.07¼	@	.07½
(Delivered Central Territory)			
News, per ton—			
Rolls, contract	62.00	@	—
Sheets	67.00	@	—
Boards, per ton—			
Plain Chip	30.00	@	35.00
Solid News	32.50	@	37.50
Manila Lined Chip	40.00	@	45.00
Container Lined—			
85 Test	50.00	@	55.00
100 Test	55.00	@	60.00

Old Papers
(F. o. b. Chicago)

Shavings—			
No. 1 Hard White	2.35	@	2.40
White Env. Cuttings	—	@	—
No. 1 Soft Shavings	2.10	@	2.15
Ledger & Writings	.70	@	.75
Solid Books	.75	@	.80
Blanks	1.60	@	1.65
Krafts	1.25	@	1.35
New Kraft Cuts	1.35	@	1.45
Manila Env. Cuts	1.50	@	1.55
Ex. No. 1 Manila	1.25	@	1.30
Print Manila	.40	@	.45
Overissue News	.40	@	.45
Old Newspapers—			
No. 1	.35	@	.40
No. 2	.30	@	.35
Mixed Papers—			
No. 1	.28	@	.30
No. 2	.20	@	.25
Roofing Stocks—			
No. 1	30.00	@	—
No. 2	28.00	@	—

PHILADELPHIA

Paper
(F. o. b. Mill)

Bonds	.05	@	.40
Ledgers	.07	@	.40
Writings—			
Superfine	.12	@	.18
Extra fine	.16	@	.22
Fine	.15	@	.26
Fine, No. 2	.13½	@	.25
Fine, No. 3	.08½	@	.20
Book, M. F.	.05	@	.07
Book, S. S. & C.	.05	@	.07½
Book, Coated	.08	@	.16
Coated Lithograph	.07	@	.11
Label	.07	@	.11
No. 1 Jute Manila	.07	@	.09
Manila Sul., No. 1	.03¼	@	.05½
Manila No. 2	.03	@	.04
No. 1 Kraft	.05¼	@	.06
No. 2 Kraft	.03½	@	.04
Southern Kraft No. 1	—	@	.03¼
Southern Kraft No. 2	—	@	.03½
Common Bogus	.03	@	.04
(Delivered Philadelphia)			
News Print Rolls	62.00	@	—
Straw Board	50.00	@	—
News Board	32.50	@	—
Chip Board	30.00	@	—
Wood Pulp Board	85.00	@	95.00
Binder Boards—			
No. 1, per ton	75.00	@	—
No. 2, per ton	68.00	@	—
Carload lots	66.00	@	70.00
Tarred Felts—			
Regular	55.50	@	57.00
Slaters (per roll)	.84	@	.94
Best Tarred, 1-ply (per roll)	1.95	@	2.10
Best Tarred, 2-ply (per roll)	1.50	@	1.60
Best Tarred, 3-ply	2.00	@	2.25

Domestic Rags (New)
(Price to Mill, f. o. b. Phila.)

Shirt Cuttings—			
New White, No. 1	.07	@	.08
New White, No. 2	.06	@	.06½
Light Silesias	.05½	@	.06
Silesias, No. 1	.07	@	.09
Black Silesias, soft	.05	@	—
New Unbleached	.07½	@	.08
Washable, No. 1	.03½	@	.04
Blue Overall	.06	@	—
Cottons—According to grades—			
Washable, No. 2	.02½	@	.03
New Blue	.02½	@	.03
Fancy	.04	@	—
New Black Soft	.04	@	.05
New Light Seconds	.02	@	.02½
New Dark Seconds	1.85	@	2.00
Khaki Cuttings—			
No. 1 O. D.	.05	@	—
No. 2 Mixed	.04	@	.04¼
Corduroy	.02½	@	.03
New Canvas	.07½	@	.08
New Black Mixed	.03	@	.03½

Domestic Rags (Old)

White No. 1—			
Repacked	3.50	@	4.00
Miscellaneous	3.00	@	3.50
M. G.	5.00	@	—
Thirds and Blues—			
Miscellaneous	1.50	@	1.75
Repacked	2.00	@	2.25
Black Stockings (Export)	3.80	@	4.00
Roofing Stock—			
Foreign No. 1	1.15	@	1.25
Repacked	.80	@	.90

Bagging
(F. o. b. Phila.)

Gunny, No. 1—			
Foreign	1.50	@	1.60
Domestic	1.75	@	—
Manila Rope	2.75	@	3.00
Sisal Rope	1.25	@	1.50
Mixed Rope	1.10	@	1.25
Scrap Burlaps—			
No. 1	1.50	@	1.60
No. 2	1.10	@	1.20
Wool Tares, heavy	3.00	@	—
Mixed Strings	1.15	@	1.25
No. 1, New Light Burlap	2.50	@	2.75
New Burlap Cuttings	2.00	@	2.25

Old Papers
(F. o. b. Phila.)

Shavings—			
No. 1 Hard White	2.60	@	2.65
No. 2 Hard White	2.30	@	2.35
No. 1 Soft White	2.25	@	2.50
No. 2 Soft White	1.40	@	1.60
No. 1 Mixed	.90	@	1.00
No. 2 Mixed	.60	@	.70
Solid Ledger Stock	1.50	@	1.60
Writing Paper	1.05	@	1.25
No. 1 Books, heavy	1.00	@	1.15
No. 2 Books, light	.90	@	.95
No. 1 New Manila	2.15	@	2.30
No. 1 Old Manila	1.50	@	1.60
Print Manila	.50	@	.60
Container Manila	.45	@	.50
Old Kraft	1.25	@	1.30
Common Paper	.25	@	.30
No. 1 Mixed Paper	.25	@	.30
Straw Board, Chip	.35	@	.40
Binders Board, Chip	.35	@	.45
Corrugated Board	.50	@	.60
Overissue News	.40	@	.45
Old Newspaper	.25	@	.30

BOSTON

Paper
(F. o. b. Mill)

Ledgers—			
Sulphite	.07½	@	.12½
Rag Content	.15	@	.30
All Rag	.38	@	.52½
Bonds—			
Sulphite	.06½	@	.11½
Rag content	.15	@	.30
All rag	.36½	@	.65
Writings	.06½	@	.20
Superfines	.11	@	.31
Book, Super	.06	@	.09
Book, M. F.	.05½	@	.08½
Book, Coated	.08¾	@	.18
Coated Litho	.09	@	.12
Label	.09½	@	.15
Jute Manila No. 1	.11	@	.13
Manila, Sul. No. 1	.04¾	@	.06½
Manila, Sul. No. 2	.03¾	@	.04½
No. 1 Kraft	.04¼	@	.05½
No. 2 Kraft	0.3½	@	.04¼
(F. o. b. Boston)			
Southern Kraft	.03¼	@	.03½
(F. o. b. destination in carload lots, f. o. b. mill in less than carload lots.)			
Common Bogus	.02	@	.02¾
Delivered New England points			
News Print, rolls	61.50	@	—
Straw Board, rolls	.009	—	@52.50
Straw Board in Sheets, basis 35s to 70s	—	@	50.00
Filled News Board	32.50	@	—
Chip Board	30.00	@	—
Chip Board (Creasing)	32.50	@	—
Single Manila Lined Chip	45.00	@	—
Single White, Patent Coated News Board			
Bender, No. 1	60.00	@	75.00
Bender, No. 2	55.00	@	65.00
Wood Pulp Board	75.00	@	80.00
Binder Boards	67.50	@	75.00

Old Papers
(F. o. b. Boston)

Shavings—			
No. 1 Hard White	3.25	@	3.75
No. 2 Hard White	2.60	@	2.90
No. 1 Soft White	2.25	@	2.40
No. 1 Mixed	.90	@	1.00
No. 2 Mixed	.60	@	.65
Solid Ledger Books	1.75	@	2.25
Overissue Ledger Stock	1.35	@	1.60
Mixed Ledgers	1.15	@	1.30
No. 1 Books, heavy	.80	@	1.00
No. 1 Books, light	.55	@	.70
Crumpled Stitchless Book Stock	1.00	@	1.25
Manila Env. Cuttings	1.85	@	2.00
No. 1 Old Manila	—	@	1.00
White Blank News	1.50	@	1.60
Kraft No. 1	—	@	1.10
Manila	.80	@	.90
No. 1 Mixed Paper	—	@	.16
Overissue News	—	@	.40
Old Newspapers	.25	@	.30
Box Board, Chip	.16	@	.20
Corrugated Boxes	.35	@	.40

Bagging
(F. o. b. Boston)

Gunny No. 1—			
Foreign	—	@	1.80
Domestic	1.60	@	—
Manila Rope—			
Foreign	2.25	@	—
Domestic	2.50	@	—
Transmission Rope	1.75	@	—
Mixed Strings	—	@	.70
Jute Rope	—	@	1.05
Jute Carpet Threads	.90	@	1.05
Bleachery Burlap	—	@	3.25
No. 1 Scrap Burlap	—	@	1.25
Scrap Sisal	1.35	@	1.40
Scrap Sisal for shredding	—	@	1.50
Wool Tares, heavy	1.30	@	—
New Burlap Cutting	1.75	@	2.00
Australian Pouches	2.50	@	—
Heavy Baling Bagging	—	@	1.75
Paper Mill Bagging	—	@	.85
Bagging No. 2	.50	@	—
No. 1 Burlap	—	@	3.50

Domestic Rags (New)
(F. o. b. Boston)

Shirt Cuttings—			
New White No. 1	.06½	@	.07
New White No. 2	—	@	.06
Silesias No. 1	.06	@	.06¼
New Unbleached	—	@	.08
Fancy	.04	@	.04½
Washable	.04	@	.04½
Cottons—According to grades			
Blue Overalls	.06¼	@	.06¾
New Black, soft	.04	@	.04¼
Khaki Cuttings	.04	@	.04¼
O. D. Khaki	.04½	@	.05
Corduroy	.03	@	.03½
New Canvas	.08	@	.08½

Domestic Rags (Old)
(F. o. b. Boston)

Canvas	.04½	@	—
White No. 1—			
Repacked	4.75	@	5.25
Miscellaneous	5.00	@	—
White No. 2—			
Repacked	.04½	@	.05
Miscellaneous	.03½	@	.04
Twos and Blues	2.50	@	2.75
Thirds and Blues—			
Repacked	1.75	@	2.00
Miscellaneous	1.50	@	1.75
Black Stockings	3.25	@	3.50
Roofing Stock—			
No. 1	.75	@	.80
No. 2	.65	@	.70
No. 3	.50	@	.60
No. 4	—	@	.69

Foreign Rags
(F. o. b. Boston)

Dark Cottons	.75	@	.85
New No. 1 White Shirt Cuttings	7.75	@	8.00
Dutch Blues	—	@	1.80
New Checks & Blues	4.00	@	4.50
Old Fustians	1.65	@	1.75
Old Linsey Garments	.85	@	.95

TORONTO

Paper
(F. o. b. Mill)

Bond—			
No. 1 Sulphite	.12½	@	—
No. 2 Sulphite	.09¾	@	—
No. 1 Colored	.13½	@	—
No. 2 Colored	.09½	@	.10½
Ledgers (sulphite)	—	@	—
Ledgers, No. 1	.36	@	—
Ledgers, No. 2	.27	@	—
Writing	.09½	@	.10
Book—			
No. 1 M. F. (carloads)	7.12½	@	7.60
No. 2 M. F. (carloads)	6.90	@	7.35
No. 3 M. F. (carloads)	6.65	@	7.15
No. 1 S. C. (carloads)	7.60	@	8.10
No. 2 S. C. (carloads)	7.35	@	7.85
No. 3 S. C. (carloads)	7.12½	@	7.60
No. 4 S. C. (carloads)	5.95	@	6.40
No. 1 Coated and Litho	13.25	@	—
No. 2 Coated and Litho	12.25	@	—
No. 3 Coated and Litho	10.00	@	11.50
Coated tinted	14.50	@	—
Wrapping—			
Rag Brown	4.95	@	—
White Wrap	5.25	@	—
"B" Manila	5.00	@	—
No. 1 Manila	5.40	@	—
Fiber	5.40	@	—
Kraft, M. F.	5.90	@	—
Kraft No. 2	5.40	@	—

(Delivered Toronto)

News, per ton—			
Rolls (contract)	61.50	@	62.00
Sheets	67.00	@	—

Pulp
(F. o. b. Mill)

Ground Wood	30.00	@	32.00
Sulphite easy bleaching	50.00	@	—
Sulphite, news grade	70.00	@	—
Sulphite, bleached	72.50	@	75.00
Sulphate	60.00	@	—

Old Waste Paper
(In carload lots, f. o. b. Toronto)

Shavings—			
White Env. Cut	2.80	@	—
Soft White	2.60	@	—
White Blk. News	1.50	@	—
Book and Ledger—			
Flat Magazine and Book Stock (old)	1.10	@	—
Light and Crumpled Book Stock	1.20	@	—
Ledgers and Writings	—	@	—
Manilas—			
New Manila Cut	1.50	@	—
Printed Manilas	.80	@	—
Kraft	1.90	@	—
News and Scrap—			
Strictly Overissue	.70	@	—
Strictly Folded	.70	@	—
No. 1 Mixed Paper	.60	@	—

Domestic Rags
(Price to mills, f. o. b. Toronto)

No. 1 White Shirt Cuttings	.06½	@	.10
Fancy Shirt Cuttings	.06	@	.06¼

PACK the fluid end of the pump with a packing that retains its lubricant against the washing-out tendency of the fluid pumped.

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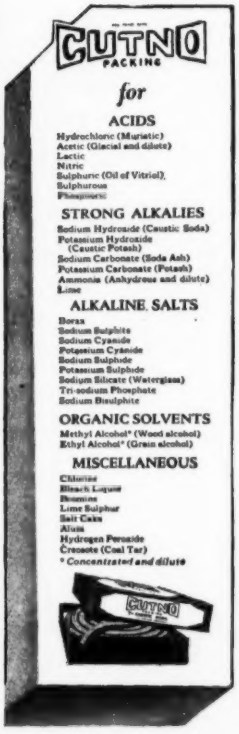
CAUSTIC SODA

and

SIMILAR CHEMICALS

use

CUTNO PACKING



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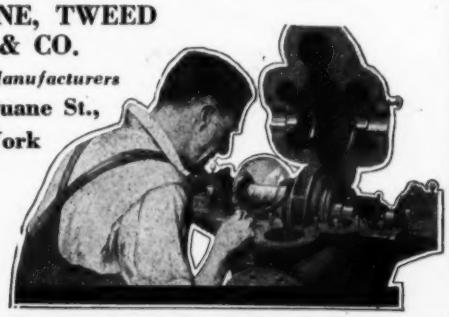

PAPER TRADE JOURNAL

ESTABLISHED 1872

THE INTERNATIONAL WEEKLY OF THE PAPER AND PULP INDUSTRY AND THE PIONEER PUBLICATION IN ITS FIELD

FIFTY-NINTH YEAR

Published Every Thursday by the

LOCKWOOD TRADE JOURNAL CO., Inc.

GEO. S. MACDONALD, President: J. BANNINGA, Sec.-Treas.

Published at 34 No. Crystal St., East Stroudsburg, Pa.

Executive and Editorial Offices: 10 East 39th Street, New York

Chicago Office: 123 West Madison St.

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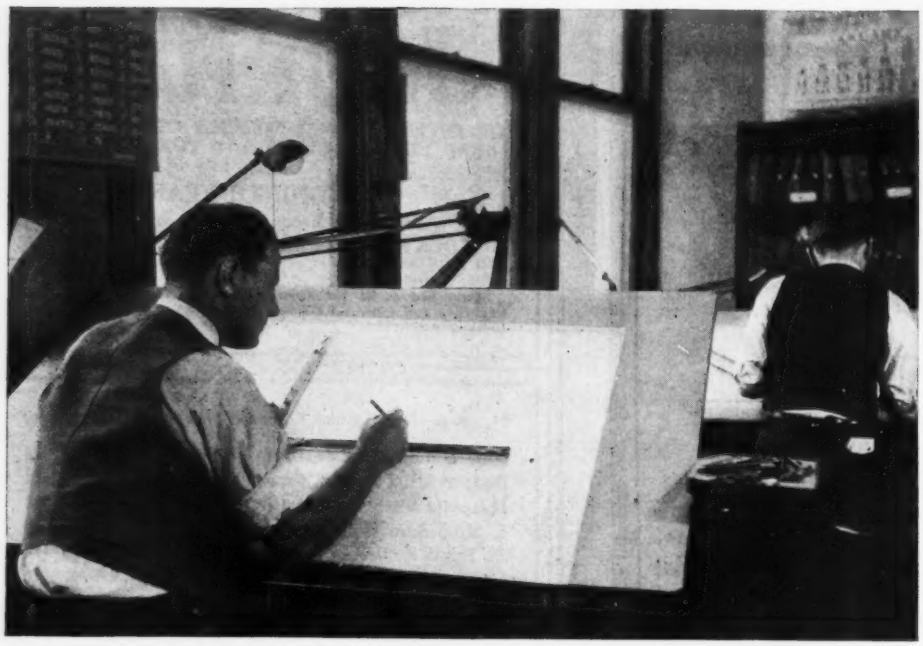
Chemical prowess at its BEST



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